

Application for Resource Consent (PART A)



environment
SOUTHLAND
REGIONAL COUNCIL
Te Taiāpunga

This application is made under Section 88 of the Resource Management Act 1991

The purpose of this Part A form and the relevant Part B form(s) is to provide applications with guidance on information that is required under the Resource Management Act 1991. Please note that these forms are to act as a guide only, and Environment Southland reserves the right to request additional information.

To: Environment Southland
Private Bag 90116
Invercargill 9840



Full name, address and contact details of applicant (in whose name consent is to be issued)

Name: Hennie & Johanna Antink \$1350 chg. us.
 Address: 717 Rima Seaward Downs Road
RD1 Invercargill 9871
 Email: antinknz@xtra.co.nz
 Phone: 027 436 4607 Preferred 03 2395 580 Additional Fax: 03 2395 580

Consultant contact details (if different from above)

Contact name/agent: JOHN SCANDRETT
 Address: Dairy Green Ltd P.O. Box 5003 Invercargill
 Email: scandrett.rural@xtra.co.nz
 Phone: 03 215 4381 Preferred 0274 355 657 Additional Fax: 03 215 4391

Please tick the box for the consent(s) you are applying for and complete the relevant Part B form(s) where available:

Land Use	Discharge	Coastal
<input type="checkbox"/> Bore/well	<input type="checkbox"/> To air	<input type="checkbox"/> Whitebait stand
<input type="checkbox"/> New or expanded dairy farming	<input type="checkbox"/> To water	<input type="checkbox"/> Structures/occupation of space
<input type="checkbox"/> Effluent storage	<input type="checkbox"/> To land	<input type="checkbox"/> Removal of natural materials
<input type="checkbox"/> Cultivation		<input type="checkbox"/> Disturb foreshore/seabed
<input type="checkbox"/> Tree planting	Water	<input type="checkbox"/> Discharge/deposit substances
<input type="checkbox"/> Gravel extraction	<input type="checkbox"/> Take and use surface water	<input type="checkbox"/> Commercial surface water activity
<input type="checkbox"/> Hill country burning	<input type="checkbox"/> Take and use groundwater	<input type="checkbox"/> Reclaim/drain foreshore/seabed
<input checked="" type="checkbox"/> Riverbed activity (incl. streams/creeks and stopbanks)	<input type="checkbox"/> Dam water	<input type="checkbox"/> Marine farming
<input type="checkbox"/> Bridges and culverts	<input type="checkbox"/> Divert water	<input type="checkbox"/> Other coastal activities

1 Are there any **current** or **expired** consents relating to this proposal?

Yes No

If yes, please provide consent number(s) and description:

2 Are any other consents required from Environment Southland or **other authorities**?

Yes No

If yes, please state the relevant authority and the type of consent(s) required:

3 For what **purpose** is this consent(s) required: (e.g. discharge of effluent, gravel extraction etc.)

To pipe 800m of the Higham Tributary, Waituna Creek.

4 **Location** of proposed activity

Address:

70 Drakes Hill Road, Oteramika

Legal Description:

Sec 27 Blk I Oteramika Hun.

Map Reference (NZTM 2000):

126 2694 E 4850 169 N

5 The name and address of the **owner / occupier**: (if other than the applicant)

Name:

Phone:

Address:

6 Please attach a map or a coloured aerial photograph, showing at a minimum, the location of the proposed activities.

Checklist: Have you included the following?

- Payment of the required deposit (*see attached fee schedule*)
- Written approval from all potentially affected parties (*forms available from the Environment Southland website*)
- Site plan/location map/sketch of the proposed activity
- A copy of the Certificate of Incorporation (*where applicant is a company*)
- Part B form(s) specific to your activity and/or a separate assessment of environmental effects (AEE)

Notes:

- (a) *If your application does not contain the necessary information and the appropriate fee, Environment Southland must return the application.*
- (b) *Council cannot accept electronic lodgement of applications at this time.*

Signature of applicant

I hereby certify that to the best of my knowledge and belief, the information given in this application is true and correct.

I undertake to pay all actual and reasonable application processing costs incurred by Environment Southland.

Name (block capitals) JOHN SCANDRETTI
Signed J Scandretti Date 12 December 2016
(Signature of applicant or person authorised to sign on behalf of applicant)

Checklist: Have you included the following?

- Payment of the required deposit (*see attached fee schedule*)
- Written approval from all potentially affected parties (*forms available from the Environment Southland website*)
- Site plan/location map/sketch of the proposed activity
- A copy of the Certificate of Incorporation (*where applicant is a company*)
- Part B form(s) specific to your activity and/or a separate assessment of environmental effects (AEE)

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Signature of applicant

I hereby certify that to the best of my knowledge and belief, the information given in this application is true and correct.

I undertake to pay all actual and reasonable application processing costs incurred by Environment Southland.

Name (block capitals) JOHN SCANDRETT 19 September 2017
Signed J Scandrett Date ~~12 December 2016~~
(Signature of applicant or person authorised to sign on behalf of applicant)

COPY

23 January 2017



GJH & GJ Amtink
717 Rimu Seaward Downs Road
RD 1
Seaward Downs
Invercargill 9871

Our Reference: APP-20179992

Enquiries to: Joanna.Gilroy@es.govt.nz

Dear Hennie and Johanna

Return of Incomplete Application - GJH & GJ Amtink

Thank you for your application to pipe a section of the Higham Tributary which is part of Waituna Creek. However, I am unable to accept it and it is returned¹¹ in accordance with Section 88(3A) of the Resource Management Act.

Whilst the application contains more information than the original application which was returned in early 2016 I am returning this new application. This is because it is incomplete and it still does not contain information required by the 4th Schedule of the RMA, the Regional Water Plan for Southland and the proposed Southland Water and Land Plan. Where an application does not contain information which addresses the 4th Schedule of the RMA and Council's plans, then it must be returned.

The decision to return this application has been carefully considered by myself and my Manager. Below I have provided you with the reasons why the application has been returned and also what information needs to be included when you re-lodge the application so that it may be considered complete.

It is strongly recommended that you, or your consultant organize a pre-application meeting before lodging the application again. This meeting can occur at our office, or out on site. The aim of these meetings is to help to ensure that all of the necessary information is included in the application before it comes in. We find these meetings to be very useful and constructive.

The following information needs to be included in the application before it can be considered complete:

- A certificate of title for the property not more than three months old. This can be downloaded from the New Zealand companies office website at: <https://www.business.govt.nz/companies/>
- An assessment of the activity against Part 2 matters of the RMA. This includes Sections 5, 6, 7 and 8. These sections relate to the overall purpose of the RMA. In this section you should detail how the activity is consistent with these sections of the Act and will achieve the purpose of the Act which includes the sustainable management of resources.

For now
& our future

Return of Incomplete Application



- An assessment of the activity against relevant objectives, policies and rules contained in any relevant National Policy Statement; Regional Policy Statement and Regional Plan. This assessment was absent from the application and must be included. A table is attached showing the sections of the relevant documents which I consider need to be assessed. A good starting point for this would be to look at the plans on the Environment Southland website located at: <http://www.es.govt.nz/publications/plans/>.
- An explanation as to support the following conclusion in the AEE that “*Piping 800 m of waterway will have an insignificant effect on the natural and physical resources that the ditch provides.*”
- Identification of any affected parties, any consultation undertaken with them and their responses to this consultation. If you have not already undertaken any consultation I recommend¹ that you consider talking to parties such as Fish and Game, the Department of Conservation and local Iwi. It is recommended that you make contact with these parties before you re-lodge the application. This is because of the cultural and spiritual values associated with water and any ecological values of the waterway.
- An assessment of effects of the piping of the waterway which includes:
 - A conclusion as to the level of effects of the activity - will the effects of the activity on water quality, ecological values and other matters be minor, more than minor or less than minor? This should be accompanied by an explanation as to how this conclusion has been reached. Coming to these conclusions is important to the decision on notification which needs to be made on the application.
 - A discussion of the cumulative effects on the receiving environment of piping 800 metres of the waterway. This assessment should look at the effects, or otherwise that the activity will have on the wider waterway i.e. what is the effect of modifying even more waterway when some has already been done.
 - A discussion of what the effects of the piping will be on have on fish and aquatic habitat in the 500 meters of the waterway which provides the most habitat of the stretch of waterway which is to be piped. Is there no effect because the fish are going to be moved or because the stream does not provide a high level of habitat? Also, will these effects be minor, less than minor or more than minor?
 - Confirmation that all of the proposed mitigation methods discussed in the Ryder report (including the moving of fish) will be implemented and what their effective will be at mitigating the effects. of the activity. This includes detailing any mitigation work and planting that may occur further downstream and whether or not you will be applying for consent for these activities.
- Clarification as to why and how the activity can be undertaken without the need for a water permit to dam and divert water away from the work area, or an application for a water permit. This is required because I consider that a water permit is required under the operative and proposed Regional Plans in order for the works

¹ You are not obliged to consult with any persons as per Section 6(3) of the 4th Schedule of the RMA

to be undertaken. A copy of the application form is attached for you.

- An explanation as to why you do not need a discharge to water permit, or include an application for a discharge to water permit. I consider that an application for this activity should be included in the application as it is likely that sediment will be generated as a result of the works which may be discharged to water. A copy of the application form is attached for you.
- The waterway to be piped is one which Council cleans as part of their drainage maintenance operations. Bylaw approval from Council will be required for this activity. It is recommended that you consider looking into gaining this approval.
- A clear description of the other activities that are part of the proposal which the application relates to. In the application riparian plating, habitat creation and works to culverts are mentioned. However confirmation that these works will occur, if they need consent or not and how the works will be completed needs to be provided. This is a requirement of the 4th Schedule of the RMA.

The above information is required in order for your application to be considered complete in accordance with section 88(2) of the Resource Management Act. After you have the above information you can then re-lodge the application.

If a deposit was lodged with the application, this will be retained by Council for two weeks. If the application is not re-lodged before **3 February 2017**, it will be returned to you less any costs incurred to date.

Yours sincerely



Joanna Gilroy
Team Leader Consents

Encl: Consent Application, application forms and table of policy documents

CC: J Scandrett c/- Dairy Green, P O Box 5003, Invercargill

[1] Under Section 357 of the Resource Management Act, any person who has had an application returned as incomplete under section 88(3), has a right of objection to the appropriate consent authority in respect of that requirement. Any such objection shall be made by notice in writing to the consent authority or local authority, setting out the reasons for the objection, within 15 working days after the decision or requirement being notified to that person, or within such further time as may in any case be allowed by the consent authority or local authority.

Document	Sections to consider:
RMA	Sections 5, 6, 7 and 8 in Part 2
National Policy Statement on Freshwater.	Sections A, B, C and D
Operative Regional Policy Statement	Water quality
	Lakes, rivers and wetlands
	Takata Whenua
	Biodiversity
Proposed Regional Policy Statement	Chapter 3 – Tangata Whenua Chapter 4, Part A – Water Quality Chapter 4, Part B – Water Quality Chapter 5, Part C – Beds of Rivers and Lakes Chapter 5 – Rural land/soils Chapter 6 – Biodiversity Chapter 10 – natural Features and Landscapes
Operative Regional Water Plan	Water quality and quantity
	Land and soil
	River bed and lake bed use and development
	Water quantity
Proposed Southland Water and Land Plan	Objectives 1-9 and 13-17 Policies 1-3, A4, 13,15 B7, 20, 28, 30, 32, 39A, 40 42 and 44

Dairy Green Ltd

Practical Engineering Solutions

Consents, Effluent, Stock water, Irrigation

Design through to Installation

Irrigation NZ Accredited Designer

GJH & GJ Amtink

Proposal to Drain 800 m of the Higham Tributary

Dairy Green Limited, 10 Kinloch Street, PO Box 5003, Waikiwi, Invercargill 9843

Phone 03 215 4381

Email: dairygreenltd@xtra.co.nz

1. Background

GJH and GJ Amtink purchased an existing dairy farm at 70 Drakes Hill Road on 1 June 2015.

Hennie Amtink is an experienced and successful dairy farmer who has regard for good environmental management. This has been well demonstrated at his home property at 717 Rimu Seaward Downs Road.

Upon purchase of the property a number of issues related to the Higham Tributary that flows through the property and joins the Waituna Creek were noted. Particularly in the upper reaches the ditch banks are deep, near vertical and frequently slump and have silt wash off, which then deposits on the ditch bed. The vertical banks are as a result of mechanical cleaning of the ditch by Council contractors. Bank slumping also undermines the existing riparian fences. The Higham Tributary is fully piped upstream of Drakes Hill Road.

The culverts across the ditch were poorly designed and allow direct run off into the channel at times. The culverts also have plunge pools below them, which increases the risk of culvert failure as well as impeding fish passage.

The ditch is parallel and close to the southern boundary of the farm, which gives three of the paddocks between the ditch and boundary a long and narrow shape. This is not ideal for stock management purposes. Cows tend to track along their length, increasing the risk of soil compaction and surface run off into the ditch.

An aquatic ecological assessment carried out by Ryder Consulting Limited has reported that the first 800 m of ditch has low habitat value, with low to nil flows during dry periods and a dominant grass bed overlying silt. In contrast, the main stem of the Waituna Creek also flows through the property and has significantly greater water flows and much better habit values. These could be further enhanced with planting inputs into the riparian margin.

As a consequence, it is proposed to pipe the first 800 m of the Higham Tributary to resolve ongoing maintenance, fencing, paddock utilisation, culvert and run-off issues. To mitigate the loss of a limited amount of low quality habitat it is proposed to adopt a riparian planting programme for the remaining 600 m of the Higham Tributary and the 1600 m of Waituna Creek that runs through the property. A Riparian Management Plan detailing the programme of work has been developed with the support of Fonterra. This will require c.5,700 plants and re-fencing to provide a 4.5 m wide riparian margin on the north side of each waterway. The applicants are committed to implementing the programme as soon as regulatory approval for the piping work has been granted. An additional benefit will be the elimination of potential fish passage issues at two culverts on the Waituna Creek. Currently the culverts have their inverts well above water level on the downstream side, which impedes fish passage. It is proposed to use rocks to build up the bed level of the downstream areas so that the water level on the downstream side is not below the culvert invert level and fish passage is ensured.

2. Statutory Considerations

Schedule 4 of the RMA requires that an assessment of the activity against the matters set out in Part 2 and any documents referred to Section 104. Sections 104B and 104D of the Act set out the matters that, subject to Part 2, the Consent Authority must have regard to when considering an application for discretionary and non-complying activities. An assessment of each of these matters follows:

Part 2 of the RMA

Section 5

Under Part 2 of the Act, Section 5 sets out the purpose of the Act as follows:

- (1) *The purpose of this Act is to promote the sustainable management of natural and physical resources.*
- (2) *In this Act, sustainable management means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural well-being and for their health and safety while*
 - (a) *sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*
 - (b) *safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and*
 - (c) *avoiding, remedying, or mitigating any adverse effects of activities on the environment.*

In order to achieve the purpose of the Act, the proposed development must be considered in the context of Section 5 above. Paragraphs (a), (b) and (c) of Section 5(2) are to be afforded full significance and applied accordingly in the circumstances of the particular case so that promotion of the Act's purpose is effectively achieved.

The proposed development will not compromise the potential of natural and physical resources to meet the reasonably foreseeable needs of future generations, and will have no more than minor adverse effects on the life-supporting capacity of air, water, soil and/or ecosystems. In fact the piping of the waterway will lead to an outcome whereby the applicant will be better able to utilise the land resource comprised in their farming operation in a much more effective and efficient way without having undue detrimental effects on the remainder of the Higham tributary and Waituna Creek downstream. This will enable the applicant to provide for their own ongoing economic wellbeing, with positive flow on effects to wider regional economy also.

Both existing and future users of the resource alike will not be materially affected by the piping of the 800 m section of Higham tributary through the applicant's property. Indeed, the proposed mitigation activities will enhance the waterway downstream of the piping reach, enabling resource users in these areas, including recreational users, to better provide for their social and economic wellbeing.

As has been demonstrated in the Assessment of Environmental Effects section of this application, any potential adverse effects of the proposed development, including any detrimental impacts on the life-supporting capacity of the watercourse and the ecosystem within it, will be minor and can be appropriately avoided, remedied and mitigated. It is therefore considered that the proposed development is in keeping with the primary purpose of the Act.

Section 6

Section 6 of the RMA lists the matters of national importance that a Consent Authority shall recognise and provide for when considering applications for resource consent. The Section 6 matters that are considered to be relevant to this proposal are:

- (a) *the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development:*
- (b) *the protection of outstanding natural features and landscapes from inappropriate subdivision, use, and development:*
- (c) *the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna:*
- (d) *the maintenance and enhancement of public access to and along the coastal marine area, lakes, and rivers:*
- (e) *the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga:*

It is considered that the proposed activity does not impact directly on the coastal environment, wetlands, and lakes and their margins. It is also considered that the proposed development will not adversely affect the natural character of any river. The Higham tributary is already a highly modified waterway and continues to be subject to regular human interventions and influences. Therefore the natural character values of the waterbody are very low and the proposed development is considered to be an appropriate use of the resource in terms of the marginal impacts it may have on these values.

In addition the proposed development will not adversely affect any outstanding natural feature or landscape. The Aquatic Ecology Assessment undertaken by Ryder Consulting did not identify the site as being significant in terms of habitats for indigenous fauna, nor is any significant indigenous vegetation identified on the site.

There is currently no established public access to the Higham tributary or Waituna Creek maintained through the applicant's property. Therefore the proposal will not adversely affect public access and is considered to accord with the provisions of Te Tangi o Tauria.

Having regard to the above, it is considered that the proposed development adequately provides for the matters of national importance set out in Section 6 of the Act.

Section 7

Section 7 of the Act sets out other matters that must be taken into consideration in achieving the purpose of the Act. The relevant other matters set out in Section 7 are as follows:

In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall have particular regard to—

- (a) *kaitiakitanga:*
- (aa) *the ethic of stewardship:*
- (b) *the efficient use and development of natural and physical resources:*
- (d) *intrinsic values of ecosystems:*
- (f) *maintenance and enhancement of the quality of the environment:*
- (g) *any finite characteristics of natural and physical resources:*
- (h) *the protection of the habitat of trout and salmon:*

The activity is considered to represent an efficient use of a natural resource that will give rise to significant positive benefits in terms of providing for the social and economic wellbeing of the applicants and the wider regional economy. There is, however, the potential for adverse effects on the environment to arise, including the loss of instream ecosystems and habitat for fish (trout and native fish species) and other aquatic species. However, it is considered that the effects of the activities have been adequately identified and assessed in the Assessment of Environmental Effects section of this application, and any effects will be no more than minor. Moreover, some of the mitigation measures proposed, such as riparian planting and stream enhancement, will lead to positive outcomes in terms of the quality of the riparian and instream environment further downstream, and an improved habitat for aquatic life and enhanced water quality.

Section 8

Section 8 sets out a Consent Authority's responsibilities in relation to the Treaty of Waitangi. As is discussed in further detail below, the proposal is considered consistent with the provisions of all regional planning documents, including Te Tangi o Tauria, and Sections 6(c) and 7(a) of the Act. Therefore, the proposal can also be considered consistent with Section 8 of the Act.

Having had regard to the matters outlined above it is considered that the proposed development achieves the purpose of the Resource Management Act 1991.

Section 104 Assessment

Section 104(1)(b) of the Act requires the Consent Authority to have regard to the relevant provisions of the following documents which are assessed in further detail below:

- National Policy Statement for Freshwater Management
- Regional Policy Statement for Southland 1997
- Proposed Southland Regional Policy Statement 2012
- Regional Water Plan for Southland 2010
- Proposed Southland Water and Land Plan 2016
- Te Tangi a Taurira (Ngai Tahu ki Murihiku Natural Resource and Environmental Iwi Management Plan 2008)

National Policy Statement for Freshwater Management (NPSFM):

The following objectives and policies of the NPSFM have been considered:

Objective A.1

This objective seeks to safeguard the life-supporting capacity, ecosystems and indigenous species of freshwater in sustainably managing the use and development of land and the discharge of contaminants. The Aquatic Ecology Assessment undertaken on behalf of the applicant concluded that riparian enhancement of approximately 1300m of channel and modifications to two culverts to improve fish passage will mitigate the adverse effects of piping 800m of the Higham tributary. Therefore the proposal is considered to safeguard, and indeed enhance, the life-supporting capacity of the river, and the instream ecosystems. The applicant also proposes to transfer any fish life from the piped section to an unaffected area downstream, ensuring any indigenous fish species are safeguarded. The proposal is also not considered to have any detrimental impact on the health of any people or communities downstream of the new piped section of waterway.

Objective A.2

This objective seeks to maintain or improve water quality in the region while protecting the significant values of outstanding freshwater bodies and wetlands, and improving the water quality in waterbodies already significantly degraded. The Higham tributary is not considered an outstanding waterbody. While the Waituna Creek and associated wetlands downstream are considered outstanding and the water quality within these features has already been significantly degraded by human activity, the proposed piping of a length of the Higham tributary will not result in any additional adverse impacts on the water quality of these features, and indeed will likely have a positive effect on them through the riparian planting and stream enhancement being proposed as mitigation.

Policies A1 – A3

These policies seek to give effect to the above objectives by requiring regional councils to make certain changes to their Plans to introduce provisions relating to the establishment of freshwater management units and the freshwater objectives and limits set to manage water quality and quantity within in them. As is discussed further below, the proposed activity is considered to align with the provisions in the operative Regional Water Plan, and the changes being introduced through the provisions of the Proposed Southland Water and Land Plan 2016. The application is therefore not considered inconsistent with these policies.

Objectives B1-B4

These objectives establish a goal of safeguarding the life-supporting capacity, ecosystems and indigenous species of freshwater in sustainably managing the taking and use of water, including through avoiding any further over-allocation and phasing out existing over-allocation of freshwater; improving and maximising the efficient allocation and use of water; and protecting the significant values of wetlands and outstanding waterbodies. As discussed under Objective A.1 above, the Aquatic Ecology Assessment undertaken on behalf of the applicant concluded that overall the proposal is considered to

safeguard, and indeed enhance, the life-supporting capacity of the river, and the instream ecosystems. The proposal is not considered to have any significant impact on the flows and availability of freshwater to any other resource users further down the catchment.

Policies B1-B6

Similar to the assessment of Policies A1-A3 above, the policies in the water quantity section of the NPSFM seek to give effect to the water quality objectives by requiring regional councils to make certain changes to their Plans to introduce provisions relating to the establishment of freshwater objectives and limits, and providing for the efficient allocation and efficient use of the resource in a way that gives effects to those objectives and limits. As is discussed further below, the proposed activity is considered to align with the provisions in the operative Regional Water Plan, and the changes being introduced through the provisions of the Proposed Southland Water and Land Plan 2016.

Policy B5 also requires that regional councils ensure that no decision will result in future over-allocation of all freshwater in an FMU. As discussed above, the proposed activity will not have any significant impact on the availability or allocation of freshwater within the wider catchment.

Objective C1 and Policies C1 and C2

These provisions relate to the need to improve the integrated management of freshwater, and the use and development of land, on a catchment wide basis. This is proposed to be achieved by regional councils making policy changes where necessary to ensure that they manage freshwater and land use and development in an integrated and sustainable way. The proposed piping work is considered to achieve this integrated management by ensuring that the effects of the adjoining land use, i.e. the dairy farm operation, are reduced by providing for riparian planting along a significant stretch of waterway further downstream, further limiting the risk of contaminants being discharged into the waterbody. Furthermore, the proposed riparian planting will provide and enhanced instream habitat for aquatic species as well. Overall the proposed activity is considered to have a positive impact on the freshwater resource and is thereby considered to achieve good integration between the freshwater and rural land resources.

Objective D1 and Policy D1

Tangata whenua values and interests in relation to freshwater are to be identified through the involvement of iwi and hapu in the management of freshwater and decision-making on freshwater planning. As is discussed in further detail below, the proposed activity is considered to accord with the provisions of the Iwi Management Plan, Te Tangi a Tauria, and is therefore consistent with this objective and policy.

Regional Policy Statement for Southland 1997 (Operative RPS):

5.5 Water Quality

The objectives and policies of the Water Quality chapter of the Operative Southland RPS are aspirationally very similarly to those in the NPSFM discussed above. In general, the objectives seek to sustain the water quality of the region's water resources in order to meet the ongoing needs of the community and resource users, while also recognising the relationship of Maori to water, and safeguarding the life-supporting capacity of the resource and associated ecosystems. Objective 5.3 in particular seeks to ensure that the diverting of water and discharge of contaminants does not compromise water standards. This is notably similar to Objective 5.2 which seeks to ensure that water quality is maintained and enhanced when water and land resources are used and developed, and when contaminants are discharged. These objectives are given effect to by Policy 5.5 which requires the Council to assess the effects of land use and development activities on water quality, and provide for the avoidance, mitigation and remedying of these effects as necessary.

As has already been discussed above, the proposed activity is not considered to present any significant risks in terms of adverse impacts on water quality, and the mitigation measures proposed by the applicant will ensure that any effects that may arise are appropriately managed.

5.6 Lakes, Rivers and Wetlands

The objectives and policies of this section of the Operative RPS set out the need to protect the natural character, heritage values and outstanding natural features of lakes, rivers and wetlands in the region, while also recognising and providing for the relationship Maori have with these resources; maintaining and enhancing public access; and avoiding wherever practicable, remedying and mitigating the adverse effects of activities on the beds of these features.

The policies that give effect to these objectives and that are most relevant to this particular development are Policy 6.5, which seeks to encourage the provision and enhancement of public access; Policy 6.6, which seeks to enhance water quality, amenity, in stream values and bank stability; and Policy 6.9, which seeks to provide for the continued maintenance of community drains.

As has been discussed elsewhere, the waterway has been extensively and repeatedly modified overtime to the point that it is no longer considered to hold natural character values of any great significance. Similarly, there are no significant heritage values identified in the Higham tributary, nor is it, or any of the surrounding landscapes, considered to be an outstanding natural feature.

In terms of public access, no formal public access arrangements currently exist and none are proposed. The waterway is considered to be of little value recreationally and, given is not known as a mahinga kai site. Therefore, the enhancement of public access to the area is not considered necessary, and the proposal is considered not to be in any conflict with this policy.

The piping proposal will obviously remove the need for any ongoing mechanical cleaning in that section of the waterway moving. It is expected that the riparian planting proposed by the applicant along the downstream reach may potentially impede the ability to access the waterway for mechanical cleaning purposes in these areas. However, this planting will likely reduce the need for such intervention in the future by stabilising the streams banks and reducing the amount of sediment entering the water. So while the proposed activity may not give full effect to Policy 6.9 of the Operative RPS, it is considered inappropriate to do so as it would incur a high opportunity cost in terms of missing out on an chance to enhance the waterbody and reduce any drainage issues.

5.1 Takata Whenua

The objectives of the Operative RPS in relation to tangata whenua are to protect wahi tapu from adverse effects; recognise the importance of wahi tapu, wahi toanga, mahinga kai and the customary use of water to iwi; incorporate these Maori cultural and spiritual values in resource management decisions; and have particular regard to the principle of kaitiakitanga.

Recognition of the relationship of tangata whenua with their ancestral lands, water sites, waahi tapu and other taonga has been provided for through the direction set in the Ngai Tahu ki Murihiku Natural Resource and Environmental Management Plan Te Tangi a Tauria (2008). An assessment of this document is included below.

Proposed Southland Regional Policy Statement 2012 (PSRPS):

Chapter 3 – Tangata Whenua

The objectives and policies of the PSRPS are similarly focused to the corresponding provisions of the Operative RPS in that they seek to involve tangata whenua in resource management decision making processes, and ensure that the interests of tangata whenua are taken into account and given due consideration. Again, this has largely been done through consideration of the direction set out in Te Tangi a Tauria, an assessment of which follows below.

Chapter 4 – Water Quality

Similar to the provisions of the Operative RPS, the objectives of the water quality section of the PSRPS seek to safeguard the life-supporting capacity of water and related ecosystems, and the health of people

and communities by maintaining or enhancing the region's water quality, while at the same time ensuring the ongoing social, cultural and economic needs of the community are provided for. Particular emphasis is placed on halting the decline of, and indeed improving, water quality in lowland water bodies. To achieve these objectives the policies provide for the development of freshwater objectives, and the subsequent management of discharges to meet those objectives.

While the freshwater objective setting process is yet to occur for the Mataura Freshwater Management Unit, within which the Waituna Freshwater Sub Unit is located, the proposed activity is not considered to present any significant risks in terms of adverse impacts on water quality, and the mitigation measures proposed by the applicant will ensure that any effects that may arise are appropriately managed.

Chapter 4 – Water Quantity

The two objectives of the water quantity section of the PSRPS seek to ensure that the allocation and use of water in the region is efficient, and that water quantity limits are developed in a way that safeguards the life-supporting capacity of water and related ecosystems, including by supporting the maintenance or enhancement of water quality. At the same time, the objectives also seek to ensure the ongoing social, cultural and economic needs of the community are provided for. The most relevant policy in terms of this particular development proposal is Policy WQUAN.1, which directs that the instream values of surface water are maintained.

Again, while the freshwater objective setting process for this catchment is yet to occur, overall the proposal is considered to safeguard, and indeed enhance, the life-supporting capacity of the river, and the instream ecosystems. The proposal is not considered to have any significant impact on the flows and availability of freshwater to any other resource users further down the catchment.

Chapter 4 – Beds of Rivers and Lakes

The objectives and policies of the PSRPS that relate to the management of the beds of rivers and lakes provide for the maintenance and enhancement of all significant values of lakes and rivers, and the maintenance and enhancement of public access to these features in a strategic and co-ordinated manner, in accordance with the values attributed to the area.

As is discussed above, the values associated with this particular waterway are not considered to be significant and therefore there appears to be little strategic benefit or necessity in requiring the enhancement of public access to the area. As such the proposal is considered not to be in any conflict with this policy.

Chapter 5 – Rural Land/Soils

The objectives and policies of the Rural Land/Soils section of the PSRPS are generally supportive of what the applicant is trying to achieve with the proposed works. The application is considered consistent with Objective 1, which seeks to achieve the sustainable use of Southland's rural land resource, in that it allows the development of land for agricultural purposes without adversely impacting on the life-supporting capacity of soil, which is what Objective 2 seeks to safeguard. It enables the development of the resource in a way that supports communities in providing for their social and economic wellbeing, as provided for by Policy 1, without having any significant adverse effect on the rural amenity and character protected by Policy 2. The proposed work will also be managed in a way that achieves the overall maintenance and likely enhancement of both water quality and indigenous biodiversity, as required by Policy 5, and safeguards the mauri of water and soils.

Chapter 6 – Biodiversity

The objectives of the Biodiversity section of the PSRPS are to understand the extent of indigenous ecosystem and habitat loss, maintain and protect those areas and habitats that are identified as being significant, and enhance the overall range, extent and condition of indigenous biodiversity in the region, particularly those areas considered most at risk. The policies that follow on from these objectives set the criteria to be used when assessing the significance of indigenous biodiversity, require the protection of biodiversity identified as being significant in accordance with those criteria, require the maintenance

of all other indigenous biodiversity, and ensure due consideration of tangata whenua values and interests in indigenous biodiversity, including actively involving them in the management of the issue. The policies commit the regional council to encouraging and supporting community biodiversity initiatives and active management methods, as well as recognising the value of biodiversity offsetting and the role of landowners in the management of indigenous biodiversity.

The affected section of the waterbody and its surrounding environments have not been identified as being significant in any regional or district plans, or in the ecological assessment undertaken on behalf of the applicant. While the presence of some indigenous and taonga species have been identified, that does not necessarily mean the location is a significant habitat for these species. Furthermore, the applicant is proposing to offset any loss of habitat and mitigate any impact on these species by providing an improved habitat downstream and undertaking relocation of the fish into these areas prior to the work being commenced. Overall the application is not considered to be inconsistent with any of the biodiversity provisions of the PSRPS, and should in fact lead to positive biodiversity outcomes.

Chapter 10 – Natural Features and Landscapes

The provisions of the Natural Features and Landscapes chapter of the PSRPS are focused with protecting as a matter of national significance, those natural features and landscapes that are considered “outstanding” from inappropriate land use and development. The provisions also seek to manage the adverse effects of land use and development on other identified landscapes and natural features of local significance. The Higham tributary is reasonably typical of the small tributaries to the regions waterways that drain the rural lowlands of Southland. Furthermore, the waterway has been subject to ongoing mechanical cleaning and as such is now highly modified with limited aesthetic value, and more or less resembles an unremarkable farm drainage ditch in appearance. The waterway is not considered to hold any significant landscape or geomorphological value, and as such the proposed works are not considered to result in any adverse effects that are more than minor. The application is therefore considered consistent with these particular PSRPS provisions.

Regional Water Plan for Southland 2010:

Water Quality

Objective 2 of the Regional Water Plan seeks to maintain water quality in such a way as to ensure that there is no reduction in quality beyond the zone of reasonable mixing for discharges. Objective 3 seeks to maintain and enhance the quality of surface water bodies so that the values associated with them are sustained, which for lowland surface water bodies such as Waituna Creek includes bathing, fish life (trout and native species), stock drinking water, cultural values and natural character (including aesthetics). Where these goals are not met, Objective 4 seeks to manage discharges to achieve a 10 percent improvement in selected water quality parameters over 10 years.

The proposal is likely to result in an overall enhancement of water quality of the waterbody through in stream improvements and riparian planting. It is therefore considered consistent with the water quality provisions of the Regional Water Plan.

Water Quantity

Like the other documents referred to above, the water quality provisions of the Regional Water Plan focus on ensuring protection of the life-supporting capacity of water and associated ecosystems, natural character, heritage and cultural values, while at the same time supporting people and communities in meeting their social, cultural and economic needs, and maximising the efficient use of water.

The stretch of water affected is not identified as having particularly significant values. Where there are values that may be affected, these effects are appropriately mitigated, including through the movement of any potentially affected fish stocks to an appropriate location downstream.

River Bed Use and Development

Objective 10 seeks to maintain or enhance the diversity and integrity of aquatic and riverine habitats and ecosystems, while Objective 12 seeks to maintain and enhance public access. The objectives also seek to protect significant historic heritage values (Objective 11) and the natural character and outstanding natural features of rivers (Objective 13).

As discussed above, the affected section of the Higham tributary does not hold any significant value in terms of historic heritage or natural character and landscape features. Habitat and ecosystem values will be impacted in the location of the proposed works, but these impacts will be mitigated through the translocation of affected fish stocks, and offset by habitat enhancement downstream.

Proposed Southland Water and Land Plan 2016:

Region Wide Provisions

The Proposed Water and Land Plan includes a set of region-wide objectives that provide direction very similar in nature to the other documents assessed above. In general, the objectives seek to manage freshwater and its associated ecosystems as an integrated natural resource, while at the same time recognising the social, cultural (including access to and use of mahinga kai sites) and economic values associated with them.

Objective 6 is highly aspirational in its requirement that there be no reduction in the quality of freshwater. This is to be achieved by ensuring that water quality is maintained where it has not already been degraded, and is enhanced where it has been.

Objective 9 requires that the quantity of water in surface waterbodies is managed so that aquatic ecosystem health, life-supporting capacity, outstanding natural features and landscapes, recreational values, natural character, and historic heritage values of surface waterbodies and their margins are safeguarded, and water is available both instream and out-of-stream to support the reasonable needs of people and communities to provide for their social, economic and cultural wellbeing.

Similarly, Objective 13 enables the use and development of land and soils, provided (among other things) the discharge of contaminants to land or water that have significant or cumulative effects on human health are avoided, and any adverse effects on ecosystems, amenity values, cultural values and historic heritage values are avoided, remedied or mitigated and these values are maintained or enhanced.

Objectives 14-17 reiterate the need to maintain and enhance indigenous biodiversity, recognise and provide for the identified taonga species, maintain public access to river and lake beds, and protect natural character values of surface water bodies.

Objective 18 concludes with an overall direction that all activities operate at “good (environmental) management practice” or better to optimise efficient resource use and protect the region’s land, soils, and water from quality and quantity degradation.

The region wide policies that have been developed in response to these objectives, generally speaking, provide for the recognition and management of iwi interests, and the management of the effects of contaminants in each of the identified physiographic zones. For this property the policies relating to the Gleyed and Oxidising physiographic zones are the most relevant. Policy 6 requires the avoidance, remedying and mitigation of adverse effects in the Gleyed physiographic zone through good management practices in relation to the transportation of contaminants via artificial drainage and overland flow, with particular regard to be had to these effects when assessing resource consent applications and management plans. Policy 10 requires the similar management of adverse effects in the Oxidising physiographic zone, with the addition of a consideration of contaminants transported via deep drainage.

The proposed activity is considered to be generally well aligned with the region wide objectives and policies of the PSWLP. Any adverse effects on water quality are likely to be minor only, and temporary in nature during the installation period. Adverse effects on water quantity are also only likely to be minor at most with no significant change in the quantity of water available downstream for any recreational, cultural, commercial and community users. The proposed activity is also not considered to have any significant impact on the environment in terms of indigenous biodiversity, natural character and landscapes, historic heritage, amenity, public access and tangata whenua values.

Water Quality

Policy A4 relates to the freshwater objectives established by the NPSFM and as such is considered to have been adequately assessed above. For the sake of completeness, it is considered that the proposed activity is consistent with this policy. While there is the potential for the discharge of sediment associated with the proposed installation works, these effects will be temporary in nature, and no more than minor in terms of their impact on the life-supporting capacity of freshwater and any associated ecosystems.

Policy 13 requires that land use activities and discharges are managed so that water quality, human health and health of domestic animals and aquatic life is protected. Policy 15 requires that water quality is maintained or improved by managing discharges and land use activities in accordance with the water quality standards specified, insuring water quality is maintained where it is better than the standards, is improved where it doesn't meet the standards, and that it also meets drinking water standards and sediment guidelines.

The proposed activity is considered consistent with these policies. Human and domestic livestock health and aquatic life will be protected, including through the translocation of any fish species found in the affected stretch of water at the time of installation. The overall water quality of the waterbody will be enhanced through stream improvements and riparian planting.

Water Quantity

Policy B7 relates to the freshwater objectives established by the NPSFM and as such is considered to have been adequately assessed above. For the sake of completeness, it is considered that the proposed activity is consistent with this policy. While there will be adverse effects in terms of the impact the activity will have on the life-supporting capacity of freshwater and any associated ecosystems within the section of the water way to be piped, these effects will be adequately offset by riparian planting and stream improvements further downstream, meaning that on balance the activity will have positive environmental effects and any adverse effects are considered to be minor in nature.

Policy 20 sets out how the taking and use of both surface water and groundwater will be managed. The policy consists of four different limbs which:

- list the matters on which adverse effects of taking and using surface water must be avoided, remedied or mitigated;
- list the matters on which significant adverse effects on groundwater must be avoided, remedied or mitigated;
- ensure that water is used efficiently and at a volume and rate that is appropriate for the intended end use; and
- recognise the positive benefits of water use.

Water quantity effects will be no more than minor. The proposal is not anticipated to result in any significant impacts on any of the matter listed in the policy and is therefore considered to be in keeping with the direction it provides.

Other Policies

Policy 28 requires structures and bed disturbance activities to be managed in a way that avoids, remedies or mitigates adverse effects on, among other things, water quality and quantity; habitats, ecosystems and fish passage; indigenous biodiversity; historic heritage; tangata whenua values; public access; amenity values; natural character and landscape values; and river morphology and dynamics.

Each of these matters have been covered previously under the above assessments of other policy documents. In line with those assessments the proposed activity is considered to be consistent with this policy also. While the proposed activity will have some adverse effects, particularly in terms of habitat disturbance, these effects are considered to be well mitigated.

Policy 30 requires that drainage maintenance activities within the beds of modified watercourses are managed in a way that either avoids, remedies or mitigates significant adverse effects on the aquatic environment, or maintains or enhances habitat value. The proposed activity is designed to be of sufficient capacity to effectively deal with the anticipated quantities of water during high rainfall events. It will also remove the need for the continuation of current drainage maintenance activities undertaken within the waterway. While the work will have some adverse effects on the aquatic environment in the vicinity of the section being piped, these effects are not considered to be significant and given the level of mitigation proposed, the habitat value of the overall waterway is expected to be enhanced.

Policy 32 requires the protection of significant indigenous vegetation and significant habitats of indigenous fauna. The applicant's ecological assessment did not consider the waterway to contain any vegetation or habitats of particular significance, although it was noted that indigenous fish species were present in the affected section. While the proposed activity will impact upon the habitat within which these fish were found, habitat enhancements downstream will mean that overall the effect of the activity, ecologically speaking, is positive.

Resource Consent Applications

Policies 39-43 form a suite of overarching policies that are to be applied to the consideration of all applications for resource consent applications. Policy 39A refers to the integrated management of freshwater and land use development across whole catchments. This policy is particularly relevant to this application given the direct impact the adjoining land use activity (i.e. dairy farming) will have on the waterway (i.e. piping it to allow the development of pasture and a more practical, efficient and economic paddock layout), and the downstream effects in terms of enhancement of the waterway and its riparian margins. Overall the application is considered to demonstrate an integrated approach to resource management, with the overall outcome being an improvement in the farming operation that achieves better economic and community outcomes, and positive ecological effects as a result of the enhancement work to be undertaken as mitigation.

Policy 40 sets out the matters to be considered in determining the term of a resource consent. As the proposed piping activity will result in a permanent physical change to the property and the way the farming activity operates, the land use aspect of the proposal is an ongoing activity for which an indefinite term is appropriate. Any discharge activities are anticipated to be temporary in nature during the course of the installation period.

Policy 44 lists the Te Mana o Te Wai values that particular regard will be given to in making decisions under the PSWLP. The proposed activity is considered consistent with these values in that the adverse effects on the health and mauri of water, people and the environment will only be minor at most, and the Higham tributary is not noted as a site of cultural significance in terms of mahinga kai or wai tapu. Nor does it hold any significance from a water supply or navigational point of view. Furthermore, the proposed activity will allow for the applicant to better provide their own economic wellbeing, which will serve the wider regional economy better also.

Te Tangi a Tauria – Ngāi Tahu ki Murihiku Natural Resource and Environmental Iwi Management Plan 2008:

Section 3.5 sets out the environmental management issues of importance to iwi within the Southland Plains environment, as well as the policy approach to addressing these issues. The maintenance of water quality and water quantity, and the protection of the mauri and wairua of rivers, mahinga kai, wahi tapu, wahi taonga are all listed as important issues for iwi. The Plan also lists the issues and policies specific to the management of rivers, water quality, water quantity, activities in the beds and margins of

rivers, mahinga kai, biodiversity and freshwater fisheries, among others. These policies generally build on the more general provisions mentioned above, but add more detail and specificity in their direction. It is noted that the provisions specific to activities in the beds and margins of rivers appear to be largely focused on gravel extraction activities and are noticeably silent on any particular concerns with the type of activity being proposed. However, it is considered the provisions relating to culverts and floodworks may provide some guidance on how such activities are to be approached.

The proposed piping works are considered to be generally consistent with the provisions of Te Tangi a Tauria. Any adverse effects on the life-supporting capacity, ecosystems and habitats can be adequately mitigated, through sediment management techniques during the installation period, ensuring installation occurs in a phased manner at times of low flows so as to minimise impacts on water quality and quantity, and offset any habitat loss through downstream enhancements and riparian planting which should lead to an overall improvement in water quality and the condition of instream ecosystems and habitats. Any fish life present, including identified taonga species, would be translocated from the affected part of the waterway to a more appropriate area downstream, and this would then enable them to take advantage of these enhancements, and provide improved access to mahinga kai.

3. Consultation

Affected neighbours have been consulted and have given their approval for the proposal. Affected party forms are attached to this application.

Mr. Amtink has had a preliminary discussion with Fish and Game and Te Ao Marama Inc. regarding the proposal. They have not seen the full application including the level of mitigation proposed. Some concerns were raised by Fish and Game regarding the effects of the proposal. These concerns are responded to as follows:

1. The RMA requires that alternatives are considered only where it is likely the activity will result in a significant adverse effect on the environment. It is our assessment, informed in part by the Ryder Consulting ecological assessment, that the proposal will not have any more than minor effects on the environment, and therefore extensive consideration of alternatives is not needed. Despite this the applicant has revisited the potential alternative actions, including those proposed in your letter and the accompanying report, and comments as follows.
 - (a) The potential for the future enhancement of instream habitat is slight. The lack of/low flow in the upper 800 m reach severely limits the value of the instream habitat of this part of the tributary. As the stream is strictly rainfall fed, this is always likely to be the case, making the value to be gained by any enhancement projects minimal. Focusing enhancement efforts further downstream where flows are more extensive and more consistent will result in greater ecological gains. Furthermore, enhancement works will likely have the unintended consequence of opening up the waterway and making it more prone to grass growth, further reducing flow rates and the potential for any meaningful habitat enhancement.
 - (b)
 - i. The existing state of the tributary is predominantly the result of regular and repeated mechanical ditch cleaning processes, which have created the near vertical profile of the banks. While you have described the riparian setback as 'inadequate', we consider there is sufficient separation provided to ensure that the grazing of animals is likely to have no more than minor effects on bank stability. Mechanical ditch cleaning is likely to continue to have the most significant impact on bank stability and sediment erosion, and will probably remain doing so until either the upper reaches of the tributary are piped, or an alternative land drainage management regime is adopted by the regional council.
 - ii. Gravel removal is again ostensibly a result of the regular mechanical ditch cleaning processes employed by the regional council.
2. The hydrological and land use contexts on which the Henry Hudson rehabilitation examples are based are quite distinct from what is encountered in within the section of the Higham Tributary that is proposed to be piped, and therefore we do not consider that they are directly transferable as potential rehabilitation alternatives. The sections of waterway that have been used in the Hudson report appear to be permanently flowing waterways, within which the aquatic habitat is likely to be better established and more developed. It is also quite likely that the adjoining land use patterns allowed for extensive rehabilitation work without detrimental impacts on farm management practices and economic viability. This means that the rehabilitation undertaken will indeed likely have substantial and tangible ecological benefits with only minor operational and economic costs, and would therefore represent a good return on investment. The enduring issue with this part of the Higham Tributary is that it is solely rainfall fed and therefore regularly suffers from a lack of flow, or indeed no flow at all. This lack of flow means that the ecological value of this section of the tributary is not significant, and therefore, when also taking into account the implications for farm management practices, the returns on investment from instream or riparian rehabilitation or enhancement cannot be readily justified. In this case, not only would the rebattering, recontouring and increased sinuosity suggested by the examples used in the Hudson report result in a significant financial outlay in terms of earthworks, but it also has a cost in terms of further reducing the practical grazing areas of the farm, potentially

resulting in an increased grazing density and more soil compaction and overland flow of sediment and other contaminants. Further to this, applying the rehabilitation and enhancement techniques recommended by the Hudson report to this part of the Higham Tributary would possibly mean the removal of the existing culverts, and with them the loss of their associated drop pools. Based on the findings of the Ryder Consulting report, these drop pools provide perhaps the best habitat for aquatic species within this section of the tributary, meaning that not only would the suggested rehabilitation or enhancement work have significant negative financial and farm management implications, but it would also have the same, if not greater ecological implications (further taking into account also that the opening up of the waterway will likely lead to more prolific grass and weed growth in the channel).

3. It is acknowledged that the original application could have provided more detail on the proposed riparian planting programme on the Waituna Creek tributary that was offered as mitigation of the proposed piping work. The applicant will endeavour to provide this further detail to you in the very near future, but in the meantime you should note that the applicant has undertaken extensive and successful riparian planting projects on another property under the advice and guidance of regional council staff, and in this case sees much greater value in investing in the enhancement of the more ecologically significant areas further downstream.

It is clear from the findings of the Ryder report that the habitat quality of the top 800 m of the tributary is not significant and that habitat quality increases markedly below the 800 m mark. As discussed above, the low and intermittent flows that are typical in this section of waterway mean that the net loss of habitat in the Higham Tributary is not likely to be significant, and indeed could be higher as result of employing the ideas included in the Hudson report. It stands to reason that focusing investment on riparian and instream enhancements further downstream would add much more value overall to the catchment in terms of water quality, aquatic ecosystems and biodiversity. Given the implications enhancement works in the upper 800 m of the waterway would have in terms of potentially exacerbating ongoing farm management difficulties, it is likely that the only feasible alternative to piping is that the status quo remains and a chance for downstream enhancements is forgone.

Note: Fish and Game, the Department of Conservation and Te Ao Marama Inc. will be consulted regarding the proposal once the application has been accepted as complete by Council. Given that the application has been returned as incomplete on two previous occasions, the priority has been to address and write the application to a standard that it is accepted as complete by Council.

4. Assessment of Effects

Water Quality

Water quality will improve as a consequence of piping 800 m of the Higham Tributary for the following reasons.

- 1) The ditch is generally deeply incised with near vertical banks from years of mechanical excavation by the Regional Council's contractors. As a consequence silt slips and washes off the banks into the ditch bottom, particularly during wetter periods when higher flows occur. This provides an ongoing source of sediment, which is carried downstream to receiving waters. Sediment has a negative effect on the habitat and water quality of receiving waters such as the Waituna Creek and Waituna Lagoon. Piping 800 m of the Higham Tributary will reduce sediment loss from bank erosion to receiving waters.

2) The ditch is currently fenced off with dairy cows grazed in the paddocks on either side. The nature of the topography is such that despite the presence of riparian fencing there are times during severe rain storms when sediment and faecal coliforms can reach the ditch at critical source areas via overland flow. There are three paddocks on the south side of the ditch that are quite narrow due to the proximity of the southern boundary fence for the property. Long narrow paddocks are not ideal with a propensity of cause cows to track along their length, increasing the risk of soil compaction and increasing the risk of run-off and subsequent adverse effects on water quality. Piping 800 m of the Higham Tributary will allow for better paddock layout, which will reduce the tendency for cows to track along the Higham Tributary. This should reduce soil compaction and the risk of contaminant loss via overland flow to the Higham tributary at critical source areas, which will improve water quality of receiving waters.

3) There are several culverts providing access across the ditch and as noted in the Ryder report, their outlets are above the stream bed, i.e. perched. As a consequence plunge pools have formed from the scouring velocity of the water exiting the culvert. Furthermore, storm water flowing downhill to these stock crossing culverts is likely to discharge directly to the ditch as there is no nib and no easy means of redirecting stormwater without "reconstructing" the culvert. At present the culverts are the lowest point in the crossing and act as critical source areas; at times contaminants can reach the Higham Tributary via overland flow from culvert areas. Piping the ditch will eliminate these issues, resulting in the discharge of filtered water.

In summary, piping of 800 m of the Higham Tributary will prevent scouring of banks and consequent sediment loss, since the ditch line will be backfilled and sown to pasture. This will allow improved paddock shape and improved cow behaviour, with an associated reduction in soil compaction and run-off to receiving waterways. Culvert areas, which currently act as critical source areas that can lose contaminants to the waterway via overland flow, will be removed when the piping is installed. Piping 800 m of the Higham tributary will reduce sediment, microbial contaminant and nutrient loss, which will improve water quality of receiving waters. The adverse effect on water quality of piping 800 m of the Higham tributary will be less than minor.

Ecological Values

The Ryder report was based on a the Stream Ecological Method (SEV), which involves an assessment of 14 stream ecological functions and 28 variables describing the physical, chemical and biological functions of the stream. The study looked at an initial proposal to pipe 900 m of the Higham Tributary. The report discusses findings at three sites within the Higham Tributary, two of which were originally in the proposed piping reach (i.e. H1 and H2). Following the assessment, only one site is within the proposed piping reach as the piping reach is reduced by 100 m; H2 will not be piped. The report indicated that the upper 400 m does not provide either a good quality or permanent aquatic habitat due to it being dry for periods of the year. This part of the stream had the lowest overall mean SEV score. The effect on ecological values of losing the upper 400 m of the Higham Tributary will be less than minor due to the poor aquatic habitat it currently provides; in the Ryder study electric fishing of the 100 m reach upstream of site H1 found no fish.

The next 400 m was reported to have limited habitat diversity due to the channelised nature of the tributary. Fish are mostly limited to scour pools downstream of culverts. As is described above, the culverts are poorly designed by current standards. Should the proposed piping not go ahead, the culverts will need to be reconstructed. If Environment Southland guidelines for culvert installation are followed, the plunge pools will be lost as the culvert invert will be below bed level. This will remove the scour pool habitat, which is where fish are currently found in this reach of the stream. This section of tributary has marginally better aquatic ecology values due to a slightly better low flow regime (1 L/sec flow during the Ryder survey), and the presence of culvert plunge pools.

The loss of this limited amount of habitat will be minor and will be more than mitigated by the implementation of a riparian enhancement programme for the remaining unpiped reach of the Higham Tributary and the section of the Waituna Creek that passes through the property. For two culverts on the Waituna Creek, it is proposed to use rocks to build up the bed level of their downstream areas so that the water level on the downstream side is not below the culvert invert level and fish passage is ensured. Enhancing the vegetation in the riparian zone by new plantings of appropriate species will reduce nutrient and sediment load from overland flow and help shade the channel, reducing algal growth. Vegetation losses from riparian plants, particularly leaf and woody material, to surface waters provides habitat for invertebrates and a food source for aquatic invertebrates. This enhancement, where there is a significantly greater flow on the downstream section of the Higham Tributary and the Waituna Creek, more than compensates for the loss of low quality habitat on the upper 800 m reach of the Higham Tributary.

Cumulative effects on the receiving environment of piping 800m of the waterway

Existing modification of the Higham Tributary relates to upstream piping of the entire waterway, extensive drainage in the catchment and ongoing implementation of a mechanical cleaning programme by Council. Further modification is proposed; a further 800 m of the waterway is to be piped. The effect of further modification in the context of existing modification is minor.

The Waituna Creek has a total catchment of c.105 km² and c.76 km of waterway is maintained by mechanical cleaning under Environment Southland's management. Natural channels have been straightened and deepened to improve surface drainage within the catchment. This has had a significant effect on channel morphology and habitat, sediment and nutrient movement and continues to do so. The improved surface drainage has facilitated significant subsurface drainage in low lying areas. The maintenance programme is ongoing. The Higham Tributary and Waituna Creek will be maintained as highly modified waterways in the future. Existing cumulative effects on the wider waterway from ongoing cleaning maintenance include habitat loss, stream bank erosion and related sediment loss. Other existing effects are from critical source areas such as culverts, which lose contaminants to waterways by overland flow.

The entire length of the Higham Tributary upstream of the property is piped. Further modification through piping the adjoining 800 m on the property will not have any greater effect than the existing situation (which includes the cleaning programme). It will in fact reduce erosion and sedimentation of the wider waterway and reduce contaminant loss to the wider waterway by overland flow. When carried out in parallel with the riparian enhancement programme, the effect of piping on the wider waterway will be beneficial; increased habitat, less bank erosion and sediment loss will be some of the effects.

A significant area within the catchment has been intensively drained with tiles and on the better soils, mole drainage. For instance in the Higham Tributary catchment the entire area above Drakes Hill Road and the Amtink property has been tiled. This equates to 57 hectares. Drainage has resulted in the loss of low lying 'wetlands' where no defined channel existed. The consequences have included reduced "surface" storage, increased flow rates and increased effective soil water holding capacity of the soils.

The margin of the Higham Tributary along the proposed section to be piped is fully developed farm land. Piping this section will not have any effect on existing drainage and there will be no observable drainage effect on the rest of the catchment. The catchment size is not changing and neither is the gradient of the tributary so there will be no change in water flow rate. The effect of piping on drainage properties of the catchment will be less than minor compared to the current situation.

The cumulative effect of the loss of habitat from piping 800 m of low grade habitat on the wider waterway will be more than offset by the proposed riparian improvements in the lower Higham Tributary and in

the Waituna Creek. The enhanced habitat in these areas will more than offset the loss of ecology within the proposed section to be piped.

Piping the section will improve water quality by eliminating sediment flow from bank erosion in the piped section. It will also reduce overland flow directly into the waterway and paddocks will be able to be fenced to reduce cow movement and soil compaction. The issue of contaminant loss to the stream by overland flow, which is created by culverts in poor condition, will be resolved.

As a consequence at a catchment level there will be no negative cumulative effects due to the proposed piping, but rather a net gain of improved habitat over a waterway length of approximately 2,200 m. This length of waterway has sufficient flow to provide better habitat all year round, unlike the first 800 m of the Higham Tributary which suffers from very low to nil flows during dry periods.

Fish and Aquatic Habitat

The effect of piping on fish and the aquatic habitat in the 400 meters of the waterway that provides the most habitat of the stretch of waterway to be piped will be minor. All fish present in this stretch of waterway will be moved downstream prior to piping. This stretch of the waterway currently provides a low level of habitat.

Stream Ecological Valuation (SEV) methodology was used to assess 6 sites on the property by Ryder Consulting Limited. Site H1 is approximately 500 m downstream of Drakes Hill Road and reasonably central in the section to be piped. This site had the lowest overall mean SEV score, and scored slightly lower than the other sites for hydraulic biogeochemical and habitat provision functions.

Macroinvertebrate community index (MCI) scores were also calculated for each site. This index uses the occurrence of specific taxa to determine the level of organic enrichment in a stream. MCI scores for the H1 and H2 sites on the Higham Tributary were classified as having 'fair' habitat quality while H3 was assessed as having 'poor' habitat. Overall the macroinvertebrate communities in the Higham Tributary were as expected for the type of habitat present, i.e. small, lowland, agricultural stream, and the taxa found are both common and widespread in similar habitats throughout New Zealand.

A fish survey was undertaken by Ryder Consulting Ltd. One fish (banded kokopu) was found at site H1, in a scour pond below a culvert. No fish were found above site H1, although the flow at the time of approximately 1 L/sec severely limits fish habitat. A banded kokopu and longfin eel were found at site H2 and a banded kokopu and brown trout were found at site H3.

It can be reasonably expected that piping the first 400 m of Higham Tributary below Drakes Hill Road will have less than minor effects on fish and aquatic habitat, because of the low flow regime which at times is dry. The highly modified nature of the water course to allow effective drainage coupled with low to nil flow means piping this section will only result in the loss of what is already poor habitat.

The next 500 m of Higham Tributary was shown to support three fish species. The effects of piping this section can be considered to be minor. The Ryder report states "Fish were recorded in this reach (i.e. between H1 and H2), however they were sparsely distributed and mostly limited to places where the channel was deeper (e.g. in scour pools below culverts)." It should be noted that the proposed 800 m piping reach ends upstream of site H2; it does not include sites H2 or H3. The reach containing H2 and H3 will remain unpiPED.

Prior to work commencing any fish will be moved to the lower section and a temporary fish barrier installed. This will be effected by installing a silt fence of hay bales or similar during the piping work. The piping work will be done at a period of low flow, which again will reduce the likely number of fish in this section.

The Ryder report also states “The riparian enhancement of approximately 1,300 m of channel and modifications to two culverts to improve fish passage, will mitigate the effects of the 800 m of piping of the Higham tributary.” In fact a riparian planting plan for 2,200 m of the Higham Tributary and Waituna Creek water course length has been prepared so the mitigation available will be much greater than required to offset the loss in low grade habitat from piping 800 m of the tributary.

Mitigation

As outlined in the Ryder report, measures will be implemented to mitigate any potential adverse effects from piping of the Higham Tributary. The measures collectively will avoid, remedy or mitigate any significant adverse effects due to piping.

- The Ryder report identified increasing aquatic habitat abundance and fish abundance in the most downstream section (c.100 m) of the Higham Tributary originally proposed to be piped. Based on this finding, this section will not be piped. The proposed piping reach is reduced from 900 m to 800 m; piping will not occur downstream of point NZTM E1262040 N4849750.
 - Consent for this activity is hereby applied for.
- A riparian planting programme will be implemented. This will include the additional un piped 100 m reach of the Higham Tributary, the remaining reach of Higham Tributary and the Waituna Creek that flows through the property.
 - This activity is permitted under Rule 76 (a) of the pSWLP and resource consent is not required.
 - Rule 44 of the Regional Water Plan (2010) states that the planting of the bed of a modified water course is a restricted discretionary activity. The bed is defined as the space of land which the waters of the river cover at its fullest flow without overtopping its banks.” In this instance, planting will be outside the bed of the water course; the planting activity is a permitted activity and resource consent is not required.
 - Note: If there is conflict between regulatory conditions governing planting and the Riparian Management Plan, regulatory conditions will be followed.
- The Ryder report recommended that potential fish passage issues should be eliminated by improving two existing culverts on the Waituna Creek. Currently the culverts have their inverts well above water level on the downstream side, which impedes fish passage. It is proposed to use rocks to build up the bed level of the downstream areas so that the water level on the downstream side is not below the culvert invert level and fish passage is ensured.
 - Consent is not required for this activity.

Mitigation notes:

The Higham Tributary and Waituna Creek are both fully riparian fenced, although bank erosion means some maintenance is required on the Higham Tributary fences. Currently the main vegetation within the riparian margins is grass, although there are gorse and broom plants establishing in places.

The riparian zone will be enhanced by widening in some areas and planting. Because both waterways are mechanically cleaned, planting on both sides of the waterway is not practical. Planting on the “northern side” of each water way will improve shading and contribute to the aquatic habitat for invertebrates and fish through the contribution of leaf and woody material. It will also aid bank stabilisation.

A Riparian Management Plan has been prepared to cover the full length of the Higham tributary that is not proposed to be piped and the full length of the Waituna Creek that runs through the property. In

total 10 planting zones have been identified as well as three critical source areas, which could be suitable for the development of a nitrogen filter in the future. Currently the applicants are committed to implementing the planting programme. They will consider installing nitrogen filters in the future.

To implement the planting plan will require re-fencing to ensure a 4.5 m riparian width and the planting of 5,645 plants. Included are 1,840 *Carex Secta*, 450 swamp flax, 225 Black Matipo, 300 toetoe, with the balance made up of Chatham Is Akeake, Manuka, Cabbage trees and broad leaf.

A copy of the Riparian Management Plan is appended which details the planting zones and plant layout. Assuming that a consent is granted to allow the piping of 800 m of the Higham Tributary, planting will get underway in spring 2017.

Clarification regarding consent requirements for excavation work

The removal of aquatic plants, weeds and sediment will occur as part of the proposed piping work. There is the potential for stream disturbance and the loss of sediment to water as a consequence of the piping work.

It will be unnecessary to dam or divert water away from the work area when piping work commences and minimal sediment will be discharged to water as a consequence of the piping work. The piping work will only be carried out when conditions are dry; much of the upper reach of the water course will have minimal flow or no flow whatsoever. The downstream section will have very low flow. There will be minimal water present to dam or divert. The work involved in piping is similar in nature, scale and effect as the mechanical cleaning process that is undertaken every three years as a permitted activity (outlined below). The piping schedule of work is described in the following section.

Given the dry nature of much of the stream bed, the very low water level and flow of the downstream section and the efficient pipe laying process, which is similar in nature, scale and effect to the existing drainage maintenance programme, there will be minimal disturbance that could result in the loss of sediment to water or that would necessitate the diverting or damming of the water course prior to the earth works. As such applications for resource consent to dam or divert water, or to discharge to water are deemed unnecessary.

The proposed work is similar in nature, scale and effect to the existing drain cleaning programme carried out every three years by Council. This meets Rule 78 (a) of the pSWLP, which permits the removal of aquatic weeds, plants and sediment from any modified watercourse for the purpose of maintaining or restoring drainage outfall and any associated bed disturbance and discharge resulting from the carrying out of the activity provided a number of conditions are met. In this instance Rule 78 (a) conditions are met; the removal of aquatic plants and sediment is a permitted activity and resource consent is not required.

Similarly Rule 46 (a) of the operative Regional Water Plan permits the removal of aquatic weeds, plants and sediment from any modified watercourse for the purpose of maintaining or restoring drainage outfall and any associated bed disturbance and discharge resulting from the carrying out of the activity provided a number of conditions are met. In this instance all Rule 46 (a) conditions are met; the removal of aquatic plants and sediment is a permitted activity and resource consent is not required.

Bylaw approval for piping of part of a waterway that undergoes Council drainage maintenance

An "Appendix 1 – Bylaw Approval Application Form" for approval for the installation of the pipe has been submitted with the consent application. This relates to the Southland Flood Control Management Bylaw (2010).

5. Application for Land Use Consent for works in the beds or margins of watercourses or lakes

(PART B)

1. What is the application for?

Piping a ditch

2. What duration of resource consent is sought?

2 years

3. What is the name of the water body within which these works will take place?

Higham tributary, Waituna Creek.

4. Please describe how the works will be carried out.

The process of piping the ditch includes the following:

Stripping the topsoil from either side of the ditch for replacement later.

Removing silt from the ditch bed and ensuring an even grade for pipe installation.

Cutting a trinket in the ditch bed to lay the pipe on and lay the pipe, 330 mm diameter.

Connecting any branch tiles to the pipe.

Backfilling with filter gravel, i.e. 10 mm to 25 mm in size to a depth of 500 mm.

Backfill with subsoil and cover with topsoil.

Resow in pasture.

An inlet structure will be created at the property boundary with Drakes Hill Road.

Inspection points will be installed at fence lines.

Piping will be from the top end down so that aquatic life can move downstream ahead of the work. Fish will be physically relocated out of the work zone.

Work will be undertaken during low flow periods, the upper reach, 400m or more, is virtually dry during low flow periods.

5. Is any damming or diversion of water required as part of the proposed works?

No

6. Please state the proposed date of commencement and completion of works, and described the hours of operation.

The work will take place during normal rural contracting hours, typically 7.00 am to 6.00 pm, up to 6 days a week. The work will start as soon as the consent is granted, and upon arrival of the PVC pipes, subject to suitable low flow conditions.

7. Are any of the following features found within the existing environment of the proposed activity?

(a) Yes, there is some in-stream life. (b – f) no See Ryder aquatic ecology assessment for further details.

8. In addition to the above description of the existing environment, please provide details on the following.

Also see Ryder aquatic ecology assessment.

Ditch form.

The ditch was excavated last century and straightened to its present location.
The ditch is deeply incised with near vertical banks from years of mechanical excavation.



The bed is predominantly silt and is aggrading from bank erosion and weed growth. Currently this is removed three yearly, the spoil from the last cleaning is shown below.



The ditch banks are prone to erosion because of their near vertical profile. The following photo shows a section of bank that has slumped.



9. How will the proposed works / structures alter river flows during flood or low flow events?

Ditch flows will not be changed as a consequence of this work. The PVC pipe will cater for in excess of 13 mm rain in 24 hours on the upstream catchment, which is more than the upstream tile network will cater for.

10. How will the proposed works affect river form? How will the proposed works affect the overall river catchment?

There will be no change to the flow regime downstream of the piped section. Therefore there will be no change in hydrology. Water quality will improve since there will be no sediment movement from banks slumping.

11. Are there any structures in / over / next to the water body in the vicinity of the proposed works?

There are four culverts to allow stock access across the ditch. These will be removed as part of the pipe installation. The invert of 2 of the culverts is higher than desirable so this problem will be rectified at the same time.

Two culverts are predominately used. The topography means it is not easy diverting stormwater away from the ditch at these culverts. This problem will be eliminated with the piping of the ditch.

12. Pursuant to Schedule 4 of the Resource Management Act, 1991, there are a number of matters that must be addressed by an assessment of environmental effects. Please discuss what effects the proposed activity will have on the following:

- (a) There will be no negative effects on neighbours or the community. The pipe design will ensure no less outfall for upstream neighbours.
The ditch is not used for food gathering and has limited aesthetic value in its present state. Water quality will be improved with reduced silting. The transport of nutrients by overland flow into the waterway or by transport on clay particles will be dramatically reduced.
- (b) The current ditch line will be replaced with pasture. This will be compensated for by the planting of the lower reach of the Higham Tributary and the Waituna Creek with riparian planting.
- (c) The Ryder report describes the ecosystems involved. The upper 400 m of the ditch is of very low habitat value because it virtually dries up during summer. The next 400 m has limited habitat value, primarily limited to plunge pools below culverts.
- (d) Piping 800 m of waterway will have a minimal effect on the natural and physical resources that the ditch provides. This will be more than compensated for by the proposed riparian work on the lower section and the Waituna Creek.
- (e) The piping will be done during a low flow period to limit sediment movement. A silt trap can be excavated in advance of the work being done to catch silt at the end of the pipe section.

The noise of the machinery involved will have minimal effect on others. It is machinery commonly used in the rural environment and has to meet reasonable noise standards for operator comfort.

(f) No hazardous substances are involved

13. Please include a description of the monitoring or mitigation (including safeguards and contingency plans where relevant).

The flow of the Higham Tributary will be monitored so that the proposed works takes place during a low flow period. If heavy rain causing a rise in flow rates occurs work will stop until low flows return, a silt trap will be excavated at the end of the proposed work to reduce the risk of silt flowing downstream.

The work will happen progressively with the PVC pipe backfilled as soon as practical after installation to provide a filter around the pipe. This will limit silt movement, particularly if there are rain events during the work.

Likewise the subsoil and topsoil backfill will be placed as soon as practical after the pipe is installed to allow rapid reinstatement of the site. The sooner the site is regrassed the lower the risk of overland sediment movement.

The site will be temporarily fenced with electric fencing to keep stock off while the grass is establishing.

14. Please describe how you will minimise the release of silt, sediment, concrete and other contaminants into water.

The work will be undertaken when ditch flows are as low as possible. A silt trap will be installed to reduce the risk of silt loss downstream. The work will take place during periods of fine weather. This is necessary since vehicle access is required to the site. This will reduce the risk of sediment loss downstream.

15. Please include a description of any possible alternative location or methods for undertaking the activity and why these alternatives have not been selected.

A potential alternative to piping the ditch would be to re-batter the banks. Because of the depth of the ditch a large volume of spoil would be involved. The process would require the stripping of top soil several metres back from the proposed ditch bank edge, excavating the bank and spreading of spoil, cultivation and levelling and then topsoiling and resowing. Assuming the spoil wasn't carted away a strip in the order of 30 m wide would be involved, and an area in the order of 2.5 ha. Approximately 0.64 ha of land would be lost and no longer be available for farming. The difference between re-battering the ditch and piping the ditch is in the order of 1.0 ha of land permanently lost for the 800 m involved.

Re-battering the ditch does not solve the problem of a relatively narrow strip of land on the south side of the ditch, which is more prone to compaction from the grazing cows because of its shape. At its narrowest from the ditch bank to the south boundary fence the paddock is only 40 m wide. Long narrow paddocks result in more cow traffic up and down the paddock, compared to square paddocks. Piping the ditch will allow refencing and better shaped paddocks.



environment
SOUTHLAND

Cnr North Road and Price Street
(Private Bag 90116)
Invercargill

Telephone (03) 211 5115
Fax No. (03) 211 5252
Southland Freephone No. 0800 76 88 45

WRITTEN APPROVAL FORM

To: Environment Southland
Private Bag 90116
Invercargill 9840

Affected person's written approval to an activity that is the subject of a resource consent application

To be completed by the person requesting approval

Applicant: Hennie + Johanna Antink

Application Number: _____ Officer in Charge: _____

Type of Resource Consent: Land use consent to tile a waterway

Proposed Activity(ies): Tiling a section of the Higham tributary, Waituna Creek

Location: Waituna Creek

To be completed by the person giving approval:

Name: Bevan Pirie

and/or Organisation: for Drakes Hill Farming

Street/Road Address: 206 Drakes Hill Road R.D.1 Invercargill

*I am the owner/occupier of the following property and have authority to sign on behalf of all other owners/occupiers of the property: _____ *Delete if not applicable

I/we have studied the application for resource consent and give my/our written approval to the proposed activity/activities.

In signing this written approval, I/we understand that the consent authority must decide that I/we am/are no longer an affected person(s), and the consent authority must not have regard to any adverse effects on me/us.

[Signature]
(Signature)

7/2/16
(Date)

(Signature) ____/____/____
(Date)

Notes: If you do not understand this form and/or any details regarding the application for resource consent, then you should not provide your written approval.



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To: Environment Southland
Private Bag 90116
Invercargill 9840

Affected person's written approval to an activity that is the subject of a resource consent application

To be completed by the person requesting approval

Applicant: Henrie + Johanna Amirich

Application Number: _____ Officer in Charge: _____

Type of Resource Consent: Land use consent to tile a wetland

Proposed Activity(ies): Tiling a section of the Highalm tributary, Waituna Creek

Location: Waituna Creek

To be completed by the person giving approval:

Name: Peter + Yuona Phiske

and/or Organisation: Hillview Trust

Street/Road Address: 160 Hills Road Waituna RDI Ingl

*I am the owner/occupier of the following property and have authority to sign on behalf of all other owners/occupiers of the property: _____ *Delete if not applicable

I/we have studied the application for resource consent and give my/our written approval to the proposed activity/activities.

In signing this written approval, I/we understand that the consent authority must decide that I/we am/are no longer an affected person(s), and the consent authority must not have regard to any adverse effects on me/us.

P.H. Phiske 11/3/16
(Signature) (Date)

Phiske 11/3/16
(Signature) (Date)

Notes: If you do not understand this form and/or any details regarding the application for resource consent, then you should not provide your written approval.



environment
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WRITTEN APPROVAL FORM

To: Environment Southland
Private Bag 90116
Invercargill 9840

Affected person's written approval to an activity that is the subject of a resource consent application

To be completed by the person requesting approval

Applicant: Hennie + Johanna AMTINK

Application Number: _____ Officer in Charge: _____

Type of Resource Consent: Land use consent to tile a waterway

Proposed Activity(ies): Tiling a section of the Higham tributary Waituna Creek

Location: Waituna Creek

To be completed by the person giving approval:

Name: Bobby Woodcock

and/or Organisation: Inglenook FARMS LTD

Street/Road Address: 53 MOKOTIA ROAD

*I am the owner/occupier of the following property and have authority to sign on behalf of all other owners/occupiers of the property: _____ *Delete if not applicable

I/we have studied the application for resource consent and give my/our written approval to the proposed activity/activities.

In signing this written approval, I/we understand that the consent authority must decide that I/we am/are no longer an affected person(s), and the consent authority must not have regard to any adverse effects on me/us.

[Signature] 7 / 3 / 2016
(Signature) (Date)

(Signature) _____
(Date)

Notes: If you do not understand this form and/or any details regarding the application for resource consent, then you should not provide your written approval.

[No Subject]

Monday, 4 April, 2016 2:59 PM

From: "Gunther Family" <highfieldbj@ruralinzone.net>

To: amtinknz@xtra.co.nz

To Whom it may concern,

I would like to voice my opinion on the section of the upper Waituna tributary which Mr Hennie Amtink would like to pipe in.

I feel this would benefit water quality downstream as the first 900 metres was very silty, and prone to slumping of the drain banks.

Also I noticed from here down in the 900 metres of the drain bed slowly changed to a combination of silt, clay and some gravel (as you may see by the piles I left if they re still there). When cleaning I make a concerted effort to return as many native species and trout back to their habitat as possible. However, I did notice this section contained almost no fish.

I feel piping this section would be a great benefit to the future wellbeing of the Waituna Upper Tributary.

I can be contacted on 0272289371

Regards,

Brent Gunther
Gunther Excavating Limited.

Sediment /s removed during cleaning as per Brent Gunther's email



Sediment/silt removed during cleaning - as per Brent Cunthors email



Scandrett Rural

From: Gary Morgan <gary.morgan@es.govt.nz>
Sent: Monday, 27 March 2017 4:02 p.m.
To: Danielle Petricevich
Cc: 'scandrettrural@xtra.co.nz'
Subject: Amtink-proposal to pipe Highams Trib.

Hi Danielle,

Thanks for the opportunity to accompany you to Hennie Amtink's on Thursday 23/3 and view the proposed piping of the Higham tributary. My comments follow:

- the location of the tributary from Drakes Hill Road through the first 4 paddocks makes efficient and practical farming difficult. These paddocks are bisected by the tributary and on the south side of the tributary are quite narrow. Unless the milking herd is split the number of cows in these narrow paddocks is likely to increase soil compaction and reduce infiltration rates resulting in the possibility of increased overland flow into the tributary.
- the stock crossings over this reach are in poor condition and would need upgrading. There are perched culverts and unless nibs are installed a high risk of contaminants flowing off the crossing directly into the tributary
- the tributary from Drakes Hill Road for a distance downstream of around 800m is narrow and over deepened through repeated cleaning events. There are repeated examples of bank slumping which will generate sediment that will be transported downstream. There is no riparian vegetation other than pasture grasses.
- At the recommended downstream limit of piping shown in Fig 7 of the Ryder Consulting report the channel morphology changes from a narrow, deep, incised drain with a grass covered bed to a wider, more gently battered drain with a monkey musk/water cress covered bed. It seems to be the obvious point where piping stops and the drain is left open. This coincides with increased habitat values as described in the Ryder report.
- Planting riparian vegetation on the true right bank of the open section of the Higham Tributary to provide shading and filter overland flow will improve habitat within the tributary.
- Further riparian planting on the Waituna Creek will also improve in-stream habitat. The Amtinks and their staff are doing a great job in managing pest plants and ensuring good vegetative cover on all stream banks across the property.
- A riparian planting plan detailing species, planting design, establishment techniques and time frame needs to be drawn up and the implementation of same be a condition of any consent approval. ES Land Sustainability can coordinate the preparation of this planting plan.
- It is noted that sediment traps would be used to mitigate sediment loss from the piping operation if approved. My recommendation is to utilize silt fence and pegged hay bales in conjunction with the sediment traps

Cheers

Gary Morgan

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**COMPUTER FREEHOLD REGISTER
UNDER LAND TRANSFER ACT 1952**




R.W. Muir
Registrar-General
of Land

Identifier **SL199/113**
Land Registration District **Southland**
Date Issued 10 June 1958

Prior References

SL22/63

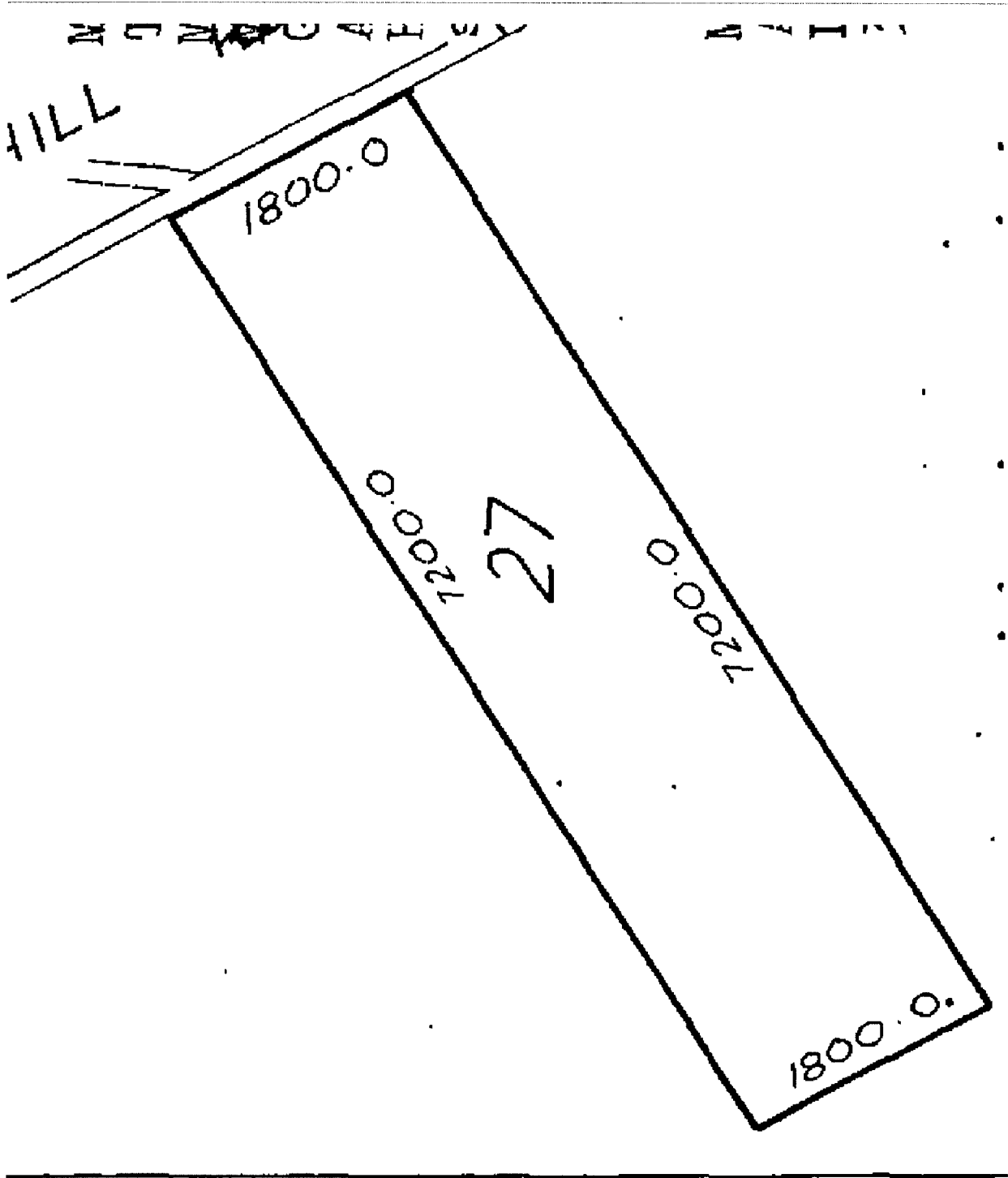
Estate Fee Simple
Area 52.4473 hectares more or less
Legal Description Section 27 Block 1 Oteramika Hundred

Proprietors

Gerrit Jan Hendrik Amtink and Gerritje Johanna Amtink

Interests

10081686.6 Mortgage to Westpac New Zealand Limited - 2.6.2015 at 3:12 pm



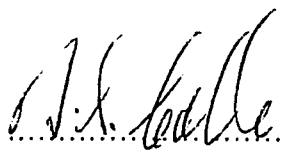
Southland Flood Control Management Bylaw 2010

That pursuant to Sections 149(1)(c), 155 and 156 of the Local Government Act 2002, the Southland Regional Council hereby resolves that the Flood Protection Management Bylaw 2010 adopted on 3 August 2010, is hereby confirmed, and shall come into force on 7 August 2010.

The foregoing resolution was passed at a meeting of the Southland Regional Council on 3 August 2010.

The Common Seal of the)
Southland Regional Council)
was hereunto affixed in)
the presence of:)




.....
Chairperson


.....
Chief Executive

1 Title and Commencement

- 1.1 This Bylaw may be cited as the Southland Flood Control Management Bylaw 2010.
- 1.2 This Bylaw shall come into force on [7 August 2010] and shall apply throughout the Southland region.

2 Revocation

- 2.1 The following bylaws and their amendments are revoked, namely;

Southland Catchment Board By-Law	No 1	1951
Southland Catchment Board By-Law	No 1	1955
Southland Catchment Board By-Law	No 3	1959

3 Purpose of Bylaw

- 3.1 The general purpose of this Bylaw is to make provision for the protection and management of flood control works undertaken by, or on behalf of the Council.

Note: Information on the areas and infrastructure that are administered, owned or managed by the Council can be obtained from the Council on request.

4 Definitions

- 4.1 In this Bylaw unless the context otherwise requires:

Authority means an authority pursuant to clause 6 of this Bylaw.

Bed means the space of land which the waters of a body of water cover at its fullest flow without overtopping its banks.

Body of Water includes that part of a lake, wetland, river, stream, passage, drain and channel on or under the ground, whether natural or not, through which water flows, whether continuously or intermittently and in respect of which there are flood control works.

Construct means to erect, install, carry out, alter, extend, fence, plant, reconstruct, remove, renew, repair, replace, and demolish.

Council means the Southland Regional Council.

Flood control works means:

- (a) any dam, weir, bank, carriageway, groyne reservoir;
- (b) any structure or appliance of any kind;
- (c) any drain, excavation, floodway;
- (d) any vegetation planting;

that is managed by or on behalf of the Council and that has or is intended to have the effect of stopping, diverting, controlling, restricting or otherwise regulating the flow or spread of flood water in or out of a body of water or the flow or spread of flood water including surface flood water.

Floodway means an area managed as a floodway by the Council that has the effect or is intended to have the effect of regulating or controlling the flow or spread of flood water.

Owner means the person who, whether jointly or separately, is seized of, or possessed of, or entitled to any estate or interest in any land in the region but does not include a mortgagee not in possession.

5 Protection of Flood Control Works

5.1 No person shall, without the prior authority of the Council granted in accordance with this bylaw:

- (a) widen, raise, lower, deepen, reduce in width, obstruct, divert or otherwise alter any body of water or flood control works;
- (b) remove shingle, gravel or sand or other material from any body of water;
- (c) remove or interfere with any machinery or equipment relating to any flood control works;
- (d) plant any vegetation on the banks, bed or floodway of any body of water or any flood control work, or in any place where that vegetation may impede access by the Council for maintenance;
- (e) construct anything in, on, over, through or under the bed or floodway of any body of water or any flood control work;
- (f) dump, deposit or store any thing on or in the bed or floodway of any body of water on or within any flood control work;
- (g) allow livestock, vehicles, machinery or equipment to adversely affect the integrity or proper operation of any flood control work;
- (h) carry out any work, including planting vegetation, in or on any flood control work or in any place where it may obstruct the free flow of flood waters in a flood way;
- (i) undertake or carry out any excavations or earthworks:
 - in or on any flood control work; or
 - within 20 metres of the landward side of any flood control work.

6 Authority to Carry Out Work

- 6.1 Any person wishing to carry out any work described in Clause 5 shall first apply in writing to the Council for authority to carry out the work. Such application shall be on Form 1 in the Appendix to this Bylaw and shall be accompanied by any fee that the Council may from time to time fix.
- 6.2 The Council may, in such circumstances as the Council may determine, refund, remit, or waive the whole or any part of any fee payable under this Bylaw.
- 6.3 The Council may grant any authority on such conditions and for such period as the Council considers appropriate.
- 6.4 The Council may, at any time, revoke any authority granted under this Bylaw.
- 6.5 A resource consent granted by the Council or agreement between the Council and any other public body authorising the carrying out of any work described in Clause 5 shall be deemed to be an authority to carry out such work for the period and on the conditions set out in the resource consent or agreement.

7 Owner Responsible for Adjoining Body of Water

- 7.1 Every owner on whose land there is, or through which there flows a body of water, shall keep the body of water and the adjoining land for a distance of 20 metres from the body of water free of all vegetation likely to obstruct the free flow of water in the body of water or to impede access for machinery to the water body to construct or maintain flood control works.
- 7.2 If any owner fails to comply with the requirement in clause 7.1 the Council may, by written notice, specify the work required to be undertaken in accordance with that clause and require the owner within a period specified in the notice to carry out that work to the satisfaction of the Council.

- 7.3 If the owner fails to comply with the conditions of a notice under Clause 7.2 the Council by its servants and agents may enter upon the land of the owner and carry out the work and the cost of doing so shall be a debt due by the owner to the Council.

8 Offences

- (a) Every person commits an offence against this Bylaw who:
- (i) does anything or causes anything to be done in contravention of this Bylaw;
 - (ii) omits to do anything required to be done by this Bylaw, the conditions of an authority, or a notice under clause 7.2.
- (b) Every person who commits an offence against this Bylaw is liable to the penalties prescribed by Section 242 of the Local Government Act 2002.

Appendix 1 - Bylaw Approval Application Form

1. Applicant(s) Details

Applicant(s) name(s)..... GJH & GJ Amtink

Organisation name (if applicable):

Postal Address 717 Rimu Seaward Downs Road

RD1 Seaward Downs

Post Code: 9871

Phone Number: Business.....

Private.....

Mobile

Fax

2. Property to which this Bylaw Approval Relates

Property address: 70 Deakes Hill Road

3. Diagram of Location of Proposed Works

Please provide a diagram of the property in the box below, detailing where the works are proposed to occur (hand drawn is acceptable). If you are also able to provide a photo of the location where the works are proposed to occur, that would be beneficial for the Engineering Unit.

See aerial photo

4. Section(s) of the Bylaw to which this Approval relates

5.1 (e) - construct anything in, on, over, through or under the bed or floodway of any body of water or any flood control work.

5. Description of the Proposed Works

Piping 800 m of Higham Tributary.

Please include a timeframe within which works are proposed to be undertaken.

Piping will be from top end down. Work will be undertaken during a dry period when there is low flow. The upper 400 m reach is typically dry at such times.

- strip topsoil from either side of ditch for replacement later
- remove silt from ditch bed and ensure an even grade for pipe installation
- cut a trench in ditch bed to lay pipe on. Lay pipe, 330 mm diameter
- Backfill with filter gravel, ie 10 mm to 25 mm in size to a depth of 500 mm
- Backfill with subsoil, cover with topsoil, resow in pasture
- An inlet structure will be created at the boundary with Deakies Hill Road.
- Inspection points will be installed at fence lines
Note fish will be relocated out of the work zone prior to work commencing.

Applicant signature

J. Scandrett

Date

19 September 2017

Southland Regional Council – approved/declined (delete one)

Signed

Date

Designation

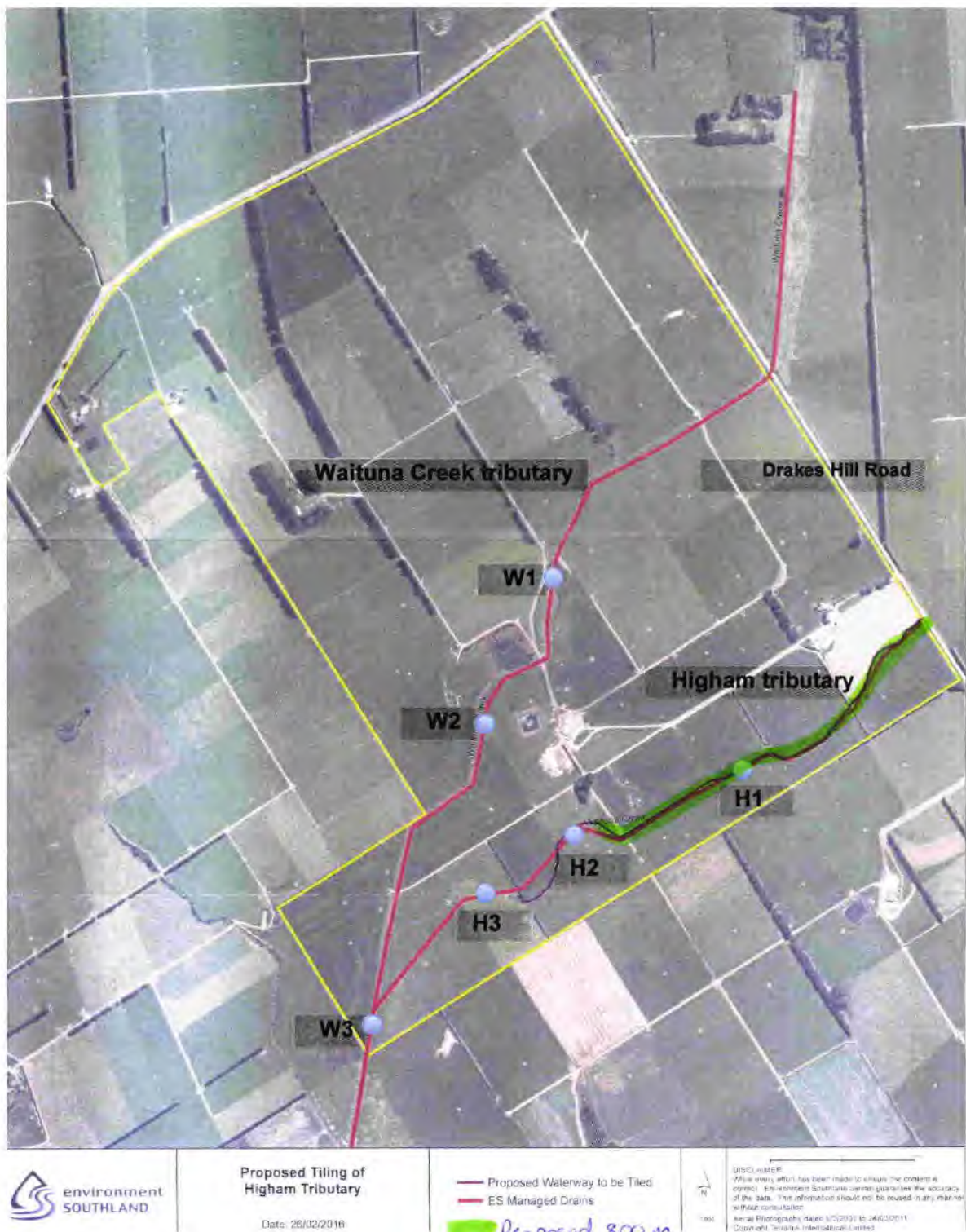


Figure 1 Amtink Farm map. Red lines show the two watercourses, Waituna Creek tributary and Higham tributary. The proposed extent of piping in Higham tributary is indicated by the purple line. The yellow line shows the property boundary (map supplied by Environment Southland). Monitoring locations in each watercourse are indicated by blue circles.

Amtink Farm

Proposed Higham Tributary piping
Aquatic ecology assessment



Amtink Farm

Proposed Higham Tributary piping Aquatic ecology assessment

Prepared for Amtink Farm by Ryder Consulting Limited

Author:

Ruth Goldsmith, PhD.

Reviewer:

Ben Ludgate, MSc.

Document version: 08/01/2017

Ryder Consulting Limited

195 Rattray Street
PO Box 1023
DUNEDIN, 9054
New Zealand

Phone: 03 477 2119

www.ryderconsulting.co.nz

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1. INTRODUCTION

Amtink Farm (owned by Hennie and Johanna Amtink) is a 190 ha dairy farm within the Waituna Creek catchment in Southland. Two watercourses have reaches within the farm boundary: Waituna Creek tributary and a smaller stream that is known locally as Higham tributary (Figure 1). The entire length of Higham tributary upstream of the Amtink Farm boundary is piped: through a culvert as it passes under Drakes Hill Road, and then upstream through the property of Peter Phiskie. Mr Amtink is proposing to continue this existing piping for a distance of approximately 900 m downstream from Drakes Hill Road through his own property. The remaining approximate 250 m length of Higham tributary to its confluence with Waituna Creek tributary will remain un-piped. Riparian enhancement of this reach of Higham tributary and also of Waituna Creek tributary is proposed. Both are excavated every three years by Environment Southland as part of their drainage maintenance programme (Figure 1)(most recently in the last 18 months).

Ryder Consulting was engaged by Mr Amtink to provide an aquatic ecological assessment of Higham tributary to determine the nature and magnitude of any ecological effects associated with the proposed piping. The assessment included the following components:

- Assessment of the existing aquatic ecology values of Higham tributary and Waituna Creek tributary within Amtink Farm.
- Identification of potential adverse aquatic ecological effects associated with the proposed piping.
- Recommendations to avoid, remedy or mitigate any significant adverse effects.

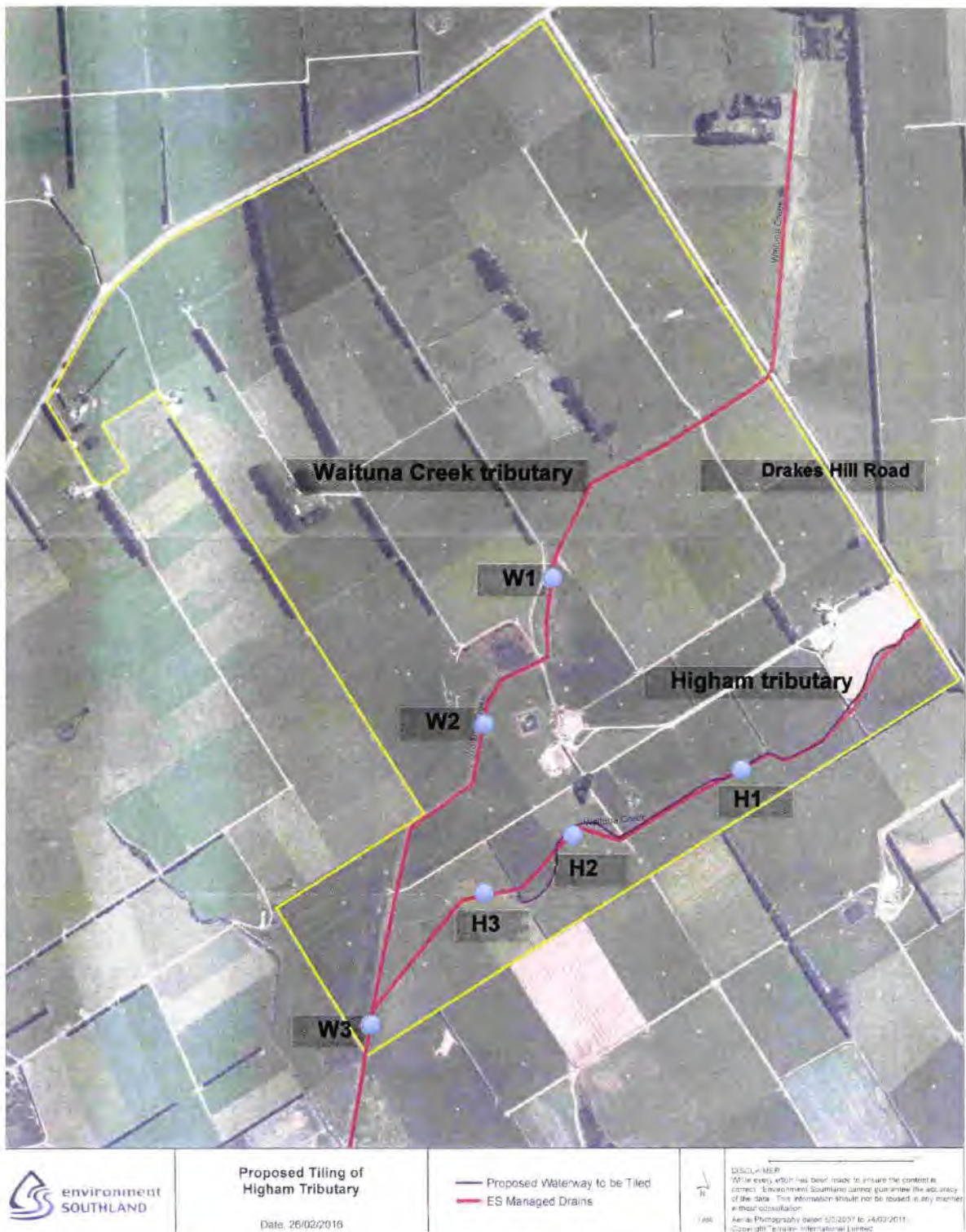


Figure 1 Amtink Farm map. Red lines show the two watercourses, Waituna Creek tributary and Higham tributary. The proposed extent of piping in Higham tributary is indicated by the purple line. The yellow line shows the property boundary (map supplied by Environment Southland). Monitoring locations in each watercourse are indicated by blue circles.

2. METHODOLOGY

2.1 Monitoring locations

A field assessment of Higham tributary and Waituna Creek tributary was undertaken on the 30th of September and 1st of October 2016 to determine their existing aquatic ecology values. Three sites were surveyed in each watercourse (Figures 1, 2 and 3). Two of the three Higham tributary sites were located in the proposed piping reach (H1 and H2) and one was located downstream (H3). One Waituna Creek tributary site was located downstream of the Higham tributary confluence (W3) and two were located further upstream (W1 and W2).

2.2 Water quality

Measurements of water physico-chemistry (conductivity ($\mu\text{S}/\text{cm}$), dissolved oxygen (saturation (%)) and concentration (mg/L)), pH, turbidity (NTU), and temperature ($^{\circ}\text{C}$)) were taken at each site using either a calibrated handheld YSI Professional Plus multi-probe field meter and a Hach 2100Q turbidimeter. Measurements were assessed against relevant water quality standards as set out in Appendix E of the Proposed Southland Water and Land Plan (June 2016) (Table 1). Waituna Creek tributary is within the 'Lowland hard bed' classification, and Higham tributary within 'Lowland soft bed'.

Table 1 Relevant water quality standards for 'Lowland hard bed' (Waituna Creek tributary) and for 'Lowland soft bed' (Higham tributary) as set out in the Proposed Southland Water and Land Plan (June 2016).

Parameter	Lowland hard bed	Lowland soft bed
Temperature ($^{\circ}\text{C}$)	Shall not exceed 23 $^{\circ}\text{C}$	Shall not exceed 23 $^{\circ}\text{C}$
Dissolved oxygen (%)	Shall exceed 80%	Shall exceed 80%
pH	Within the range 6.5 to 9	Within the range 6.5 to 9



Figure 2 Top to bottom (upstream to downstream): Waituna Creek tributary sites – W1, W2 and W3.



Figure 3 Top to bottom (upstream to downstream): Higham tributary sites – H1, H2 and H3.

2.3 Aquatic habitat

Aquatic habitat was assessed following the protocol developed by the Auckland Regional Council known as the Stream Ecological Valuation (SEV) methodology (Storey *et al.* 2011). SEV has been reviewed by the National Institute of Water and Atmospheric Research (NIWA) for use in Southland and is considered applicable without modification to most stream and river types in the region (Storey *et al.* 2011).

The SEV method involves the assessment of 14 stream ecological functions and 28 variables within a reach at least 50 m long, describing the physical, chemical and biological functions of the stream (Storey *et al.* 2011). Examples of ecological functions include provision of connectivity, organic matter input, and fish spawning habitat. Variables assessed include collection of a macroinvertebrate community sample and electric fishing to describe the fish community. SEV variable scores are combined to determine an overall index of ecological value or SEV score for stream reaches.

The SEV method recommends that if, for example, resource consent is required to pipe 70 m of stream, the SEV assessment should be conducted over the entire 70 m (Storey *et al.* 2011). The Higham tributary reach proposed for piping is 900 m long so therefore the SEV method recommendation would be for an assessment to be undertaken over the entire 900 m. However, a walk-over survey of the Higham tributary undertaken prior to the formal assessment confirmed that habitat within the tributary was relatively uniform. On this basis, three 50 m reaches spread throughout the stream were deemed sufficient to describe the available habitat within Higham tributary.

2.4 Benthic macroinvertebrate communities

One macroinvertebrate sample was collected at each site following protocol C1 of the Ministry for the Environment's protocols for sampling macroinvertebrates in wadeable streams (Stark *et al.* 2001) (kick-net sampling). Samples were preserved and later processed in the Ryder Consulting laboratory using the presence/absence protocol, as appropriate for the SEV method.

2.5 Fish communities

Fish communities were sampled using two methods, electric fishing and netting. Five minnow traps baited with 'Marmite' were set overnight at each site. After retrieval, fish were identified and measured before being returned to the area in which they were captured. Single-pass electric fishing was also undertaken at each site using a backpack electric fishing machine following the protocols of the Standardised Fish Monitoring for Wadeable Streams (Joy *et al.* 2013). Stunned fish were captured and placed in a bucket to prevent further shock, then identified and measured before being returned to the area in which they were captured. Additional electric fishing was also undertaken in Higham tributary upstream of site H1 within the proposed piping reach to provide further information on existing fish distribution.

3. RESULTS

3.1 Water quality

Water temperatures at all sites were similar and well within the Proposed Southland Water and Land Plan (June 2016) water quality standard of 23 °C, as would be expected in early spring (Tables 1 and 2). Dissolved oxygen saturation and concentration increased downstream in both watercourses, and met the Water Plan standard of greater than 80% saturation at all sites. Conductivity (which provides an indication of the concentration of contaminants in water) generally increased downstream in both watercourses, with conductivity levels generally higher in Higham tributary than Waituna Creek tributary. In contrast, turbidity levels were lower in Higham tributary than Waituna Creek tributary, most likely due to the lower water velocities in Higham tributary which would allow suspended sediments to settle on the stream bed. pH levels were similar at all sites, and were all slightly outside the lower limit of the pH standard range of 6.5 to 9, as specified in the Water Plan (Tables 1 and 2).

Table 2 Water quality at Waituna Creek tributary and Higham tributary sites.

Parameter	Waituna Creek tributary			Higham tributary		
	W1	W2	W3	H1	H2	H3
Date of measurement	01.10.16	01.10.16	30.09.16	30.09.16	30.09.16	30.09.16
Time of measurement	1400	1500	1300	1630	1530	1400
Temperature (°C)	12.1	13.5	11.2	12.1	11.4	11.4
Dissolved oxygen (%)	102.2	129.3	135.8	89.6	88.4	104.7
Dissolved oxygen (mg/L)	10.99	13.35	14.76	9.58	9.62	11.41
Conductivity (µS/cm)	162.8	170.9	172.5	169.8	198.4	194.5
Turbidity (NTU)	7.34	7.14	5.34	1.01	4.27	1.00
pH	6.14	6.37	6.34	6.02	5.51	6.09

3.2 Aquatic habitat

The aquatic habitat in Waituna Creek tributary and Higham tributary is characterised by a history of channel straightening and on-going modification (i.e., regular excavation) to maintain drainage of surrounding land within the primarily agricultural dominated catchment. These modifications have resulted in steep-sided channels of relatively uniform water depth and velocity, and lacking in the diversity of habitat types that is found in naturally meandering channels (e.g., undercut banks, run/riffle/pool sequences). Riparian vegetation that can provide shade and introduce woody debris to the channel is also lacking, and the connection of the watercourse to the floodplain is restricted due to flows being artificially contained within the deep, incised channel. Due to the lack of riparian vegetation (aside from pasture grasses) and steep sides, channel banks are prone to erosion and slumping, resulting in large amounts of fine sediments being deposited over the channel bed in places. Regular excavation assists with removing this sediment, but also removes aquatic plants that cover the bed in places and causes disturbance to aquatic habitat.

The modified, uniform nature of both the Waituna Creek tributary and Higham tributary is reflected in the low SEV assessment scores for each of the six survey sites (Figure 4). The highest function scores at all six sites were for hydraulic function, primarily due to the absence of barriers to migration and the channels maintaining a connection to groundwater. In the Waituna Creek tributary, sites W1 and W2 scored lowest of the six sites for biodiversity function, primarily due to a lack of intact riparian vegetation and low diversity fish communities. Site W3 had the highest overall mean SEV score. Overall, site H1 had the lowest overall mean SEV score, and scored slightly lower than all other sites for hydraulic, biogeochemical and habitat provision functions.

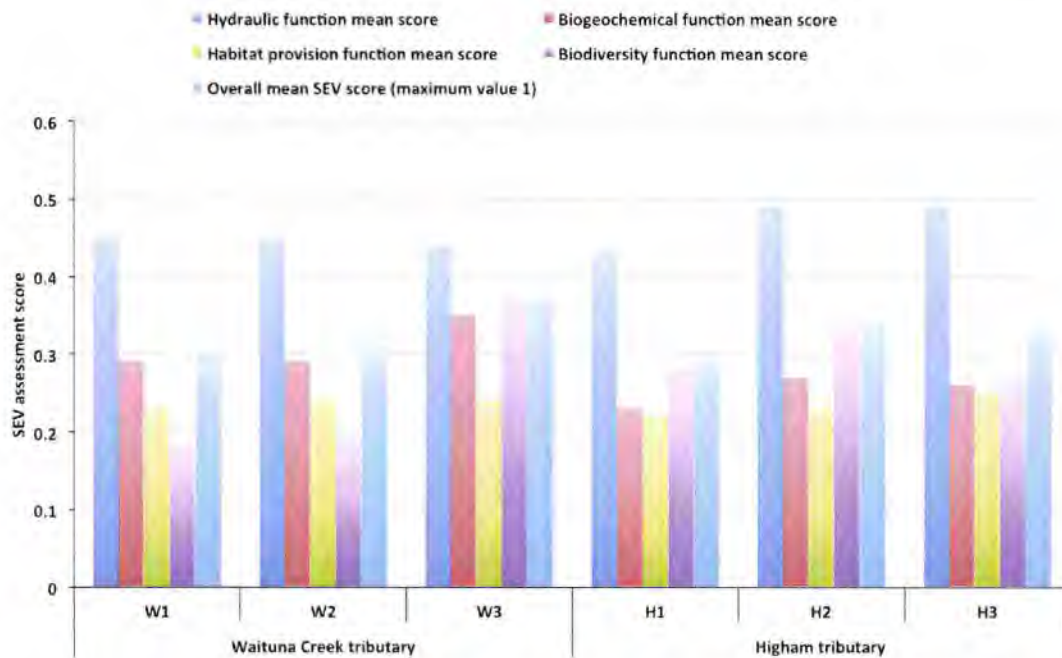


Figure 4 SEV assessment function and overall scores for Waituna Creek tributary and Higham tributary sites.

3.3 Benthic macroinvertebrate communities

A total of 19 benthic macroinvertebrate taxa were identified from Waituna Creek tributary, with the highest number of taxa recorded at the furthest upstream site, W1 (13 taxa) (Table 4). Ten taxa each were recorded at sites W2 and W3. A total of 17 taxa macroinvertebrate taxa were recorded from Higham tributary, with 14 taxa at site H1, 11 taxa at H2 and 8 taxa at H3. At all six sites the number of taxa was lower than the national median of 18 taxa per site, as determined by Scarsbrook *et al.* (2000) from samples collected from 66 sites located throughout New Zealand.

Community composition was fairly similar between the two watercourses, with 44% of taxa being found in both tributaries. Within each watercourse, the three Waituna Creek tributary sites had 26% of taxa in common, and the Higham tributary sites 35% of taxa in common.

There were very few Ephemeroptera (mayflies), Plecoptera (stoneflies) and

Trichoptera (caddisflies) (EPT) taxa¹ at any of the Waituna Creek tributary or Higham tributary sites. Aside from the caddisfly *Oxyethira*, which are considered indicative of lower quality conditions, *Deleatidium* mayflies and *Hudsonema* caddisflies were the only EPT taxa recorded, with at least one of these taxa recorded at all sites (Table 4). The national median level for EPT taxa is eight taxa per site (Scarsbrook *et al.* 2000).

Macroinvertebrate community index (MCI) scores were also calculated for each site. The MCI uses the occurrence of specific macroinvertebrate taxa to determine the level of organic enrichment in a stream. Taxon scores are between 1 and 10, 1 representing species highly tolerant to organic pollution (e.g., worms and some dipteran species) and 10 representing species highly sensitive to organic pollution (e.g., most mayflies and stoneflies). These scores can be interpreted in comparison with national standards (Table 5). For example, a low site score (e.g., 40) represents 'poor' conditions and a high score (e.g., 140) represents 'excellent' conditions. MCI scores for the Waituna Creek tributary sites were indicative of 'poor' to 'fair' habitat quality (Tables 2 and 3). None of the sites met the Proposed Southland Water and Land Plan (June 2016) MCI score standard of greater than 90 for 'Lowland hard bed' streams. In the Higham tributary, MCI scores at the two sites within the proposed piping reach (H1 and H2) were indicative of 'fair' habitat quality, while the downstream site (H3) was indicative of 'poor' habitat quality (Tables 4 and 5). Sites H1 and H2 therefore met the Proposed Southland Water and Land Plan (June 2016) MCI score standard of greater than 80 for 'Lowland soft bed' streams, but site H3 did not meet the standard.

In addition to the macroinvertebrate taxa identified in kicknet samples, freshwater crayfish (*Paranephrops zealandicus*, koura) were also captured at site W3 during fish sampling. Freshwater crayfish have been classified as 'At Risk - Declining' under the New Zealand Threat Classification System (Grainger *et al.* 2014). Koura are also identified as taonga species in Appendix M of the Proposed Southland Water and Land Plan (2016).

¹ These insect groups are generally dominated by invertebrates that are indicative of higher quality conditions. In stony bed rivers, the number of EPT taxa usually increases with improved water quality and increased habitat diversity. Note that the caddisfly *Oxyethira* (Hydroptilidae) was excluded from EPT calculations as this taxon are considered indicative of lower quality conditions.

Overall, benthic macroinvertebrate communities found in Waituna Creek and Higham tributaries were as expected for the type of habitat present (i.e., small, lowland, agricultural streams), and the taxa found are both common and widespread in similar habitats throughout New Zealand.

Table 4 Benthic macroinvertebrate taxa identified at Waituna Creek tributary and Higham tributary sites, October 2016 ('1' indicates presence).

Taxa			Waituna Creek tributary			Higham tributary		
			W1	W2	W3	H1	H2	H3
Ephemeroptera	Leptophlebiidae	<i>Deleatidium</i>		1	1	1	1	
Trichoptera	Hydroptilidae	<i>Oxyethira</i>	1					
Trichoptera	Leptoceridae	<i>Hudsonema</i>	1		1	1	1	1
Hemiptera	Corixidae	<i>Sigara</i>	1					
Hemiptera	Veliidae	<i>Microvelia</i>	1			1	1	
Odonata: Zygoptera		<i>Xanthocnemis</i>				1		
Diptera	Chironomidae	<i>Maoridiamesa</i>					1	
Diptera		Orthoclaadiinae (excl. <i>Corynoneura</i>)	1	1	1	1		
Diptera		<i>Polypedilum</i>		1				
Diptera	Simuliidae	<i>Austrosimulium</i>	1		1	1	1	1
Diptera	Tipulidae	<i>Aphrophila</i>			1			
Diptera	Tipulidae	<i>Paralimnophila</i>	1					
Collembola						1		
Crustacea	Amphipoda	<i>Paracalliope</i>	1	1	1	1	1	1
Crustacea	Amphipoda	<i>Paraleptamphopus</i>	1	1		1	1	1
Crustacea	Isopoda	Isopoda (excl. <i>Paranthurus</i>)		1				
Crustacea	Ostracoda		1			1		
Acarina						1	1	
Mollusca	Gastropoda	<i>Physa = Physella</i>				1		
Mollusca		<i>Potamopyrgus</i>	1	1	1	1	1	1
Mollusca: Bivalvia	Sphaeriidae							1
Hirudinea				1				
Oligochaeta			1	1	1		1	1
Nemertea					1			
Platyhelminthes			1	1	1	1	1	1
Number of taxa			13	10	10	14	11	8
Number of EPT taxa			1	1	2	2	2	1
MCI score			77	78	80	90	87	75

Table 5 Interpretation of macroinvertebrate community index values from Boothroyd and Stark (2000) (Quality class A) and Stark and Maxted (2007) (Quality class B).

Quality Class A	Quality Class B	MCI
Clean water	Excellent	≥ 120
Doubtful quality	Good	100 – 119
Probable moderate pollution	Fair	80 – 99
Probable severe pollution	Poor	< 80

3.4 Fish communities

Two native fish species (banded kokopu and longfin eel) and one introduced fish species (brown trout) were captured during monitoring (Table 6 and Figures 5 and 6). The New Zealand freshwater fish database (NZFFD, administered by NIWA) was also accessed to source any existing information on fish distribution. There were no NZFFD records for the watercourses, however the three species captured were expected to be present based on existing information for the Waituna Creek catchment in general.

Banded kokopu and longfin eel are both identified as taonga species in Appendix M of the Proposed Southland Water and Land Plan (2016). Longfin eels have been classified as 'At Risk - Declining' and banded kokopu are 'Not Threatened' under the New Zealand Threat Classification System (Goodman *et al.* 2014). Both species are migratory, requiring access to the sea to reproduce.

All three fish species were present in both watercourses (Table 6, Figure 6). In Higham tributary, all three fish species were captured within the proposed piping reach and fish passage did not appear to be limited by the presence of culverts downstream (Table 6).

Electric fishing was also undertaken within the piping reach for a distance of approximately 100 m upstream of site H1, but no additional fish were captured. Flow at site H1 was approximately 1 l/s (Table 6), providing only minimal habitat for fish, and it was therefore not surprising that fish were not found in the reach upstream. Given the flows observed in Higham tributary in October 2016 it is likely that sections of the proposed piping reach will dry completely during

summer, with fish habitat remaining only in deeper pools. This is supported by the fact that the fish captured at site H1 in October 2016 (banded kokopu) were found within a scour pool that had formed downstream of a culvert (Figure 5).

Table 6 Fish species identified at Waituna Creek tributary and Higham tributary sites, October 2016. Length (mm) range of fish caught in brackets. The number of culverts located downstream of each site (within the boundary of Amtink Farm), and estimated flow (l/s)² is also shown.

	Waituna Creek tributary			Higham tributary		
	W1	W2	W3	H1	H2	H3
Number of culverts downstream of site	3	2	0	10	5	3
Flow (l/s)	-	-	-	1	2	6
<i>Anguilla dieffenbachii</i> (longfin eel)	1 (310 - 330)		1 (490 - 650)		1 (400)	
<i>Galaxias fasciatus</i> (banded kokopu)			1 (139)	1 (111 - 189)	1 (74 - 164)	1 (124)
<i>Salmo trutta</i> (brown trout)		1 (159 - 160)	1 (111 - 144)			1 (100 - 140)

² Flow was estimated in Higham tributary using the 'bucket' method, downstream of perched culverts (i.e., time taken for a bucket of known volume to fill with water). It was not possible to use this method in Waituna Creek tributary due to the higher flow.



Figure 5 Fish species and the habitat where they were captured within Higham tributary, Amtink Farm, October 2016. Left to right, top to bottom (downstream to upstream): longfin eel (site H2), longfin eel (between site H1 and H2), brown trout (between site H1 and H2), banded kokopu (site H1).

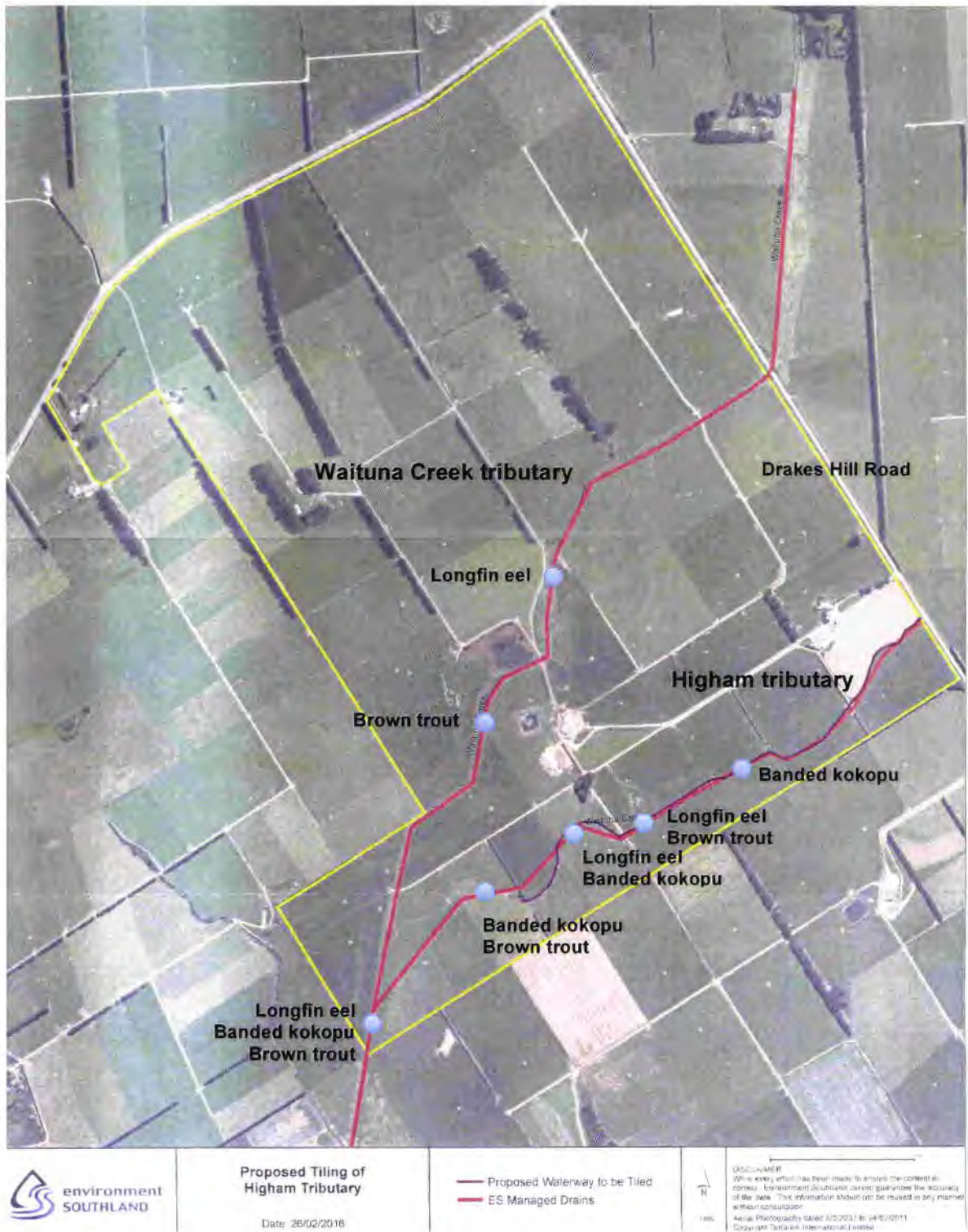


Figure 6 Locations of fish captured at Amtink Farm, October 2016.

4. ASSESSMENT OF EFFECTS AND MITIGATION

The proposed piping of Higham tributary will result in the loss of approximately 900 m of aquatic habitat. There will be no loss of connectivity for fish populations as there is no habitat upstream of the proposed piping reach. Existing aquatic ecology values in this reach are limited by the modified, uniform nature of the channel and regular disturbance to maintain its drainage function. Three fish species were, however, captured within the reach, including two native species (banded kokopu and longfin eel). But, fish were not distributed evenly throughout the reach, as the quality of the habitat varied, and therefore the potential effects of piping on aquatic habitat also vary along the reach.

Potential fish habitat is limited to approximately 500 m of the proposed 900 m piping reach, as the upper 400 m (i.e., upstream of site H1) has minimal flow for most of the year and is expected to dry up completely at times. This upper reach therefore does not provide permanent aquatic habitat. No fish were captured within this upper 400 m reach during our survey in October 2016. Aquatic habitat potential increases downstream as water volumes increase, however habitat diversity continues to be limited by the uniform nature of the channel for 400 m of the remaining 500 m of the proposed piping reach. Fish were recorded in this reach (i.e., between H1 and H2), however they were sparsely distributed and mostly limited to places where the channel was deeper (e.g., in scour pools downstream of culverts). For the remaining approximately 100 m of the proposed piping reach, aquatic habitat quality gradually increases and the abundance of fish also increases. Given the higher aquatic values of this section, and the potential for their enhancement, it is recommended that piping does not occur downstream of point NZTM E1262040 N4849750 (shown in Figure 7).

Despite its modified nature, Higham tributary still provides aquatic habitat and there is therefore opportunity for enhancement to increase the value of this habitat. As part of the proposed piping of Higham tributary, Amtink Farm are planning to undertake riparian planting in the un-piped reach of Higham tributary and also an 800 m reach of Waituna Creek tributary (Figure 7) (Amtink Farm Focussed Plan, Environment Southland 2016). Given the recommendation above that only 800 m of the proposed 900 m reach is piped, it is also recommended that planting occurs within the additional 100 m un-piped reach in

Higham tributary. Vegetation within the riparian zone can reduce nutrient, sediment and microbial loads by filtering overland flow and can reduce nutrient loads in sub-surface water by nutrient uptake, as well as maintaining or promoting conditions suitable for denitrification. One of the greatest effects of riparian vegetation is shading of the channel, particularly in narrow channels such as Higham tributary. Shading can reduce algal growth, and therefore the risk and severity of 'blooms', as well as reducing water temperatures. Riparian vegetation loses leaf and woody matter to surface waters, and in doing so can provide habitat for invertebrates and fish, and a food source for aquatic invertebrates.

Two culverts were identified in Waituna Creek tributary upstream of site W1 (within the Amtink Farm boundary) that may limit upstream passage for fish (Figure 7 and Figure 8). It is recommended that as part of the mitigation of effects on aquatic habitat in the Higham tributary improvements are made to these culverts to ensure that native fish passage is possible.

In summary, approximately 800 m of piping should occur in Higham tributary, with riparian planting along the remaining 500 m of the stream. Guidance on how this should be undertaken is provided within the Focussed Plan that has been prepared for Amtink Farm by Katrina Robertson (Land Sustainability Officer, Environment Southland 2016). The riparian enhancement of approximately 1,300 m of channel, and modifications to two culverts to improve fish passage, will mitigate the effects of the 800 m of piping in Higham tributary. Additionally, it is recommended that prior to the piping being undertaken fish are removed from the piping reach and transferred to an unaffected area (note a Ministry of Primary Industries permit will be required to undertake this). Erosion and sediment control measures should also be employed during pipe installation to ensure that downstream habitats are not affected (Auckland Council 2016).

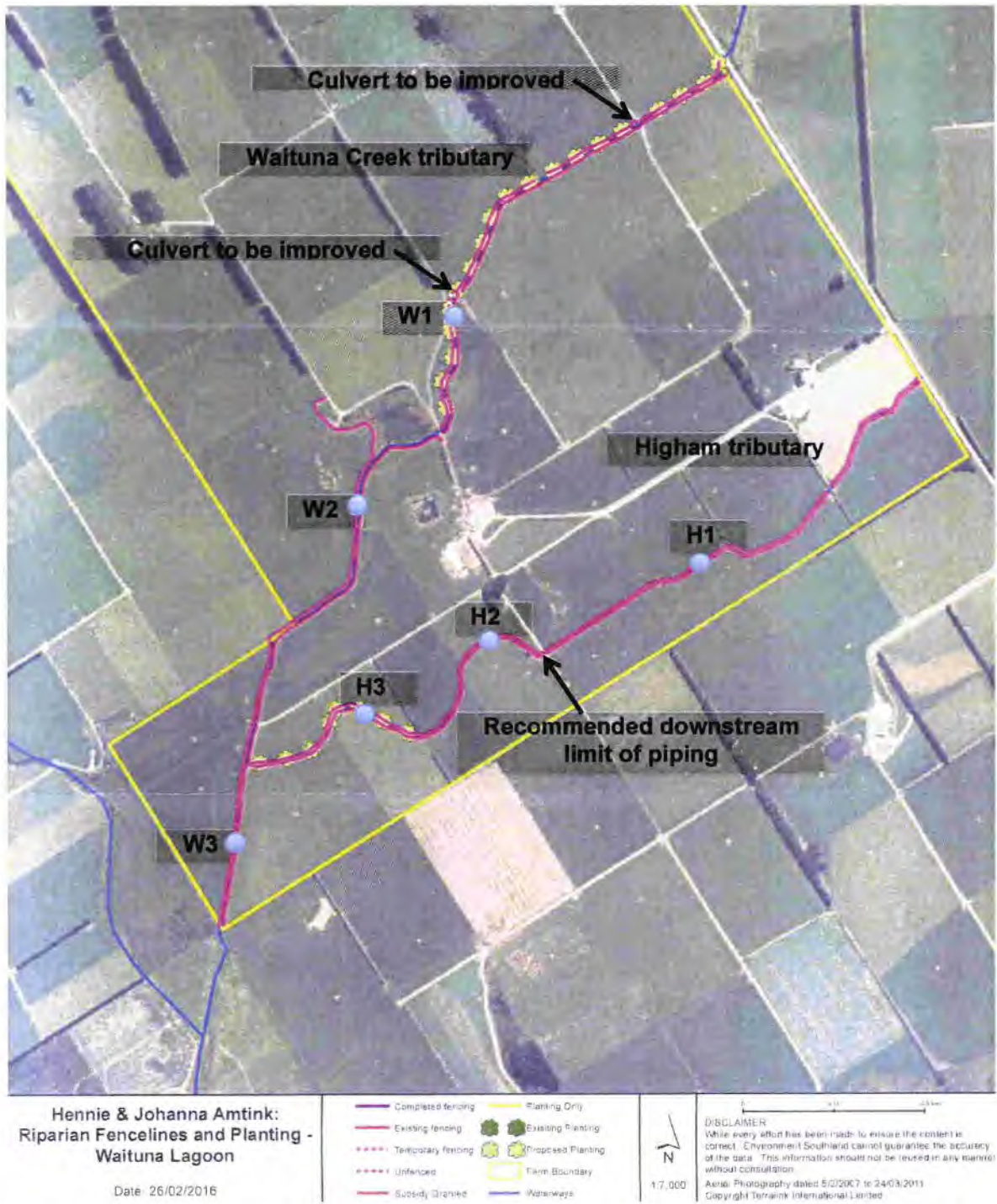


Figure 7 Proposed areas of riparian fencing and planting at Amtink Farm. The recommended downstream limit of piping, and culverts where fish passage should be improved, are also shown.



Figure 8 *Two culverts in Waituna Creek tributary at Amtink Farm where fish passage should be improved, October 2016.*

5. REFERENCES

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Riparian Management Plan Supply Number 31201

Owners: OTO Trust

Property Address: 136 Drakes Hill Road

Regional Council: Environment Southland

Total Farm Area: 193ha

Plan developed by: Cain Duncan

Date of Plan: 12th June 2017



Prioritised Riparian Management Units (RMU) for 31201

1. Waituna Creek Planting Zone



Description: Waituna Creek Planting Project beside Drakes Hill Road. The overall planting project will incorporate two rows of riparian plants along the entire length of the Waituna Creek that runs through the farm. The plantings will be comprised of lower bank plants close to the water edge (*Carex secta*) and a second row of native plants further back from the water's edge. Environment Southland will need to approve the plantings as they are being carried out on a rated waterway.

A detailed planting plan and plant list has been produced by The Plant Store which outlines the plants to be used and the required spacings. The Plant Store has been contracted to undertake the planting will in September 2017 as well as maintain the plants for 3 years to ensure they establish. Funding for the planting and maintenance is via the Living Water Partnership (DOC and Fonterra) and a 90% plant survival rate is guaranteed.

The planting will result in the creation of significant habitat for fish and other invertebrates as well as water quality benefits in terms of shading, bank stabilisation, sediment filtering and eventually a reduced need for mechanical cleaning.

Site 1 is a triangle shaped area on the eastern farm boundary with Drakes Hill Road. Taller plants could be incorporated in this area (south side) with the northern side following the same plan as the rest of the Creek.

Fencing Status: Permanently Fenced

Vegetation Status: Rank Grass

Flood Risk: Low



Proposed Area: 0.03ha (refer to appendix 1 for zone descriptions and plant options)

- Lower Zone 34% (109 m2): 1.0m plant spacings - approximately 109 plants
- Upper Zone 33% (106 m2): 1.0m plant spacings - approximately 106 plants
- Grass Buffer Strip 33% (106 m2)

Proposed completion dates:

- Fencing the RMU – Done.
- 0% Planting Progress
- Planting 100% - October, 2017



Photo 1 – Waituna Creek Eastern End – Triangle Area



Photo 2 – Waituna Creek Eastern End – Triangle Area

Comments/Progress Record:



Prioritised Riparian Management Units (RMU) for 31201

2. Waituna Creek Planting Zone



Description: Waituna Creek Planting Project. Currently there is a 2-3m margins on both sides of the creek. This section of Waituna Creek has the steepest banks on the farm. The fence will need to be relocated to allow plants on top of the bank and around the lane culvert, where the fence is over an area of slumped bank. Planting in this area will assist with bank stabilisation. See the Plant Store planting plan example for proposed plants and spacings.

Fencing Status: Fence Requires Relocation

Vegetation Status: Rank Grass

Flood Risk: Low

Proposed Area: 0.08ha (refer to appendix 1 for zone descriptions and plant options)

- Lower Zone 34% (267 m²): 1.0m plant spacings - approximately 267 plants
- Upper Zone 33% (259 m²): 2.0m plant spacings - approximately 129 plants
- Grass Buffer Strip 33% (259 m²)

Proposed completion dates:

- Fencing the RMU - July, 2017
- 0% Planting Progress
- Planting 100% - October, 2017



Photo 3 – Waituna Creek Planting Zone 2



Photo 4 – Waituna Creek Planting Zone 2 – Slumped Area

Comments/Progress Record:

Prioritised Riparian Management Units (RMU) for 31201

3. Waituna Creek Planting Zone



Description: Waituna Creek Planting Project. There are steep banks on the northern side of the creek with a riparian margin of 3-4m. On the south side of the waterway the banks are not as steep but have a similar riparian margin (3-4m). See the Plant Store planting plan example for proposed plants and spacings.

Fencing Status: Fence Requires Relocation

Vegetation Status: Rank Grass

Flood Risk: Low

Proposed Area: 0.11ha (refer to appendix 1 for zone descriptions and plant options)

- Lower Zone 34% (373 m²): 1.0m plant spacings - approximately 373 plants
- Upper Zone 33% (362 m²): 2.0m plant spacings - approximately 181 plants
- Grass Buffer Strip 33% (362 m²)

Proposed completion dates:

- Fencing the RMU - July, 2017
- 0% Planting Progress
- Planting 100% - October, 2017



Photo 5 – Waituna Creek Planting Zone 3 – Steep Banks



Photo 6 – Waituna Creek Planting Zone 3

Comments/Progress Record:

Prioritised Riparian Management Units (RMU) for 31201

4. Waituna Creek Planting Zone



Description: Waituna Creek Planting Project area. The southern riparian margin is 3-4m wide with a smaller margin 1-2m margin on the south side of the creek. The north side fence will require relocation if planting is to occur on this bank. Slope on southern bank greater than 4 degrees thus a 10m setback is required for winter grazing of the adjacent paddock under the Proposed Water and Land Plan. See Plant Store planting plan example for plant list and spacings.

Fencing Status: Fence Requires Relocation

Vegetation Status: Rank Grass

Flood Risk: Low

Proposed Area: 0.07ha (refer to appendix 1 for zone descriptions and plant options)

- Lower Zone 34% (250 m²): 1.0m plant spacings - approximately 250 plants
- Upper Zone 33% (243 m²): 2.0m plant spacings - approximately 121 plants
- Grass Buffer Strip 33% (243 m²)

Proposed completion dates:

- Fencing the RMU - July, 2017
- 0% Planting Progress
- Planting 100% - October, 2017



Photo 7 – Waituna Creek Planting Zone 4 – Eastern of Lane Culvert.

Comments/Progress Record:



Prioritised Riparian Management Units (RMU) for 31201

5. Waituna Creek Planting Zone



Description: Waituna Creek upstream of pond/wetland area. Forms part of the proposed Waituna Creek Planting Programme. See Section 1 and attached Plant Store planting schedule for further details. Planting will take place on one side (generally north) and require the relocation of fences in places to create a 4m+ buffer. Current buffer is approximately 2m on the northern side and 3m on the southern side.

Fencing Status: Fence Requires Relocation

Vegetation Status: Rank Grass

Flood Risk: Low

Proposed Area: 0.12ha (refer to appendix 1 for zone descriptions and plant options)

- Lower Zone 34% (413 m²): 1.0m plant spacings - approximately 413 plants
- Upper Zone 33% (401 m²): 1.5m plant spacings - approximately 267 plants
- Grass Buffer Strip 33% (401 m²)

Proposed completion dates:

- Fencing the RMU - July, 2017
- 0% Planting Progress
- Planting 100% - October, 2017



Photo 8 – Waituna Creek Planting Zone 5 – East of Pond/Rough Grazing Area



Photo 9 – Waituna Creek Planting Zone 5

Comments/Progress Record:

Prioritised Riparian Management Units (RMU) for 31201

6. Duck Pond/Rough Grazing



Description: Pond and rough grazing area. Surrounded in native flax, etc with some broom. If rough area is fenced off it will naturally regenerate with natives (with some weed control). Pond is fenced to exclude stock. Possible future planting/restoration project.

Fencing Status: Permanently Fenced

Vegetation Status: Native Dominated

Flood Risk: Low

Proposed Area: 0.6ha (refer to appendix 1 for zone descriptions and plant options)

- Lower Zone 20% (1201 m²): 1.0m plant spacings - approximately 1201 plants
- Upper Zone 70% (4202 m²): 2.0m plant spacings - approximately 2101 plants
- Grass Buffer Strip 10% (600 m²)

Proposed completion dates:

- Fencing the RMU - Done.
- 0% Planting Progress
- Planting 100% - 2025



Photo 10 – Pond and Rough Grazing Area



Photo 11 – Pond and Rough Grazing Area

Comments/Progress Record:

Prioritised Riparian Management Units (RMU) for 31201

7. Waituna Creek Planting Zone



Description: Southern section of Waituna Creek Planting project from the pond/rough grazing area to the farms southern boundary. This section of Waituna Creek currently has 2-3 m riparian margins with some steep bank sections, which may make planting difficult in some places. The waterway fence is a waratah and post, single wire construction so is relatively easy to move to create a 4m planting zone. Some areas already have carex gem established and there are areas of broom that will need spraying prior to planting. See Plant Store planting plan for plant species and spacings.

Fencing Status: Permanently Fenced

Vegetation Status: Rank Grass

Flood Risk: Low

Proposed Area: 0.47ha (refer to appendix 1 for zone descriptions and plant options)

- Lower Zone 34% (1596 m²): 1.5m plant spacings - approximately 1064 plants
- Upper Zone 33% (1549 m²): 2.0m plant spacings - approximately 774 plants
- Grass Buffer Strip 33% (1549 m²)

Proposed completion dates:

- Fencing the RMU – July 2017.
- 0% Planting Progress
- Planting 100% - October, 2017



Photo 12 – Waituna Creek Planting Zone 7



Photo 13 – Waituna Creek Planting Zone 7



Photo 14 – Waituna Creek Planting Zone 7

Comments/Progress Record:

Prioritised Riparian Management Units (RMU) for 31201

8. Eastern Tributary



Description: Eastern Tributary of Waituna Creek. Riparian margins of 2m maintained in rank grass to assist with filtering of any paddock run-off. This section forms part of the Living Water Planting project for the farm. See attached planting plan and species list.

Fencing Status: Permanently Fenced

Vegetation Status: Rank Grass

Flood Risk: Low

Proposed Area: 0.12ha (refer to appendix 1 for zone descriptions and plant options)

- Lower Zone 0% (0m²)
- Upper Zone 0% (0m²)
- Grass Buffer Strip 100% (1244 m²)

Proposed completion dates:

- Fencing the RMU - Done



Photo 15 – Waituna Creek Eastern Tributary – Typical Crossing Point



Photo 16 – Waituna Creek Eastern Tributary



Photo 17 – Waituna Creek Eastern Tributary



Photo 18 – Waituna Creek Eastern Tributary

Comments/Progress Record:

Prioritised Riparian Management Units (RMU) for 31201

9. Eastern Tributary



Description: Waituna Creek Tributary downstream of proposed piping. Riparian margins are currently 1-2 meters wide and maintained in rank grass. Some good patches of carex gem in middle of this section. This section forms part of the Living Water Planting project for the farm. See attached planting plan and species list.

Fencing Status: Permanently Fenced

Vegetation Status: Rank Grass

Flood Risk: Low

Proposed Area: 0.1ha (refer to appendix 1 for zone descriptions and plant options)

- Lower Zone 50% (519 m²): 1.0m plant spacings - approximately 519 plants
- Upper Zone 0% (0m²)
- Grass Buffer Strip 50% (519 m²)

Proposed completion dates:

- Fencing the RMU - Done
- 0% Planting Progress
- Planting 100% - September 2017
-

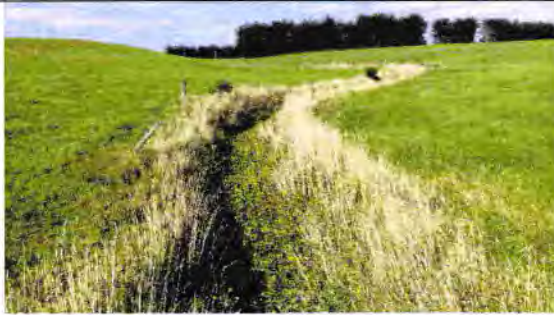


Photo 19 – Waituna Creek Eastern Tributary – Below proposed piped section.



Photo 20 – Waituna Creek Eastern Tributary – Below proposed piped section.



Photo 21 – Waituna Creek Eastern Tributary – Below proposed piped section.

Comments/Progress Record:

Prioritised Riparian Management Units (RMU) for 31201

9. Eastern Tributary (Proposed to Pipe)



Description: Small waterway with multiple crossing points. The stream has steep banks in places with signs of erosion. The stream has an average riparian margin of 1m and a stream width of 0.5m. This section of the stream is proposed to be piped to reduce sediment loads, erosion and allow better paddock utilisation. Proposed piping is subject to resource consent being granted by Environment Southland. Part of the mitigation for this work is the planting along Waituna Creek which will enhance fish habitat, provide shading and enhance the overall biodiversity of the farm.

Fencing Status: Permanently Fenced

Vegetation Status: Weed Dominated

Flood Risk: Low

Proposed Area: 0.16ha (refer to appendix 1 for zone descriptions and plant options)

Proposed completion dates:

- Fencing the RMU - Done



**Photo 22 – Waituna Creek Eastern Tributary –
Section Proposed to be Piped.**



**Photo 23 – Waituna Creek Eastern Tributary –
Section Proposed to be Piped.**



**Photo 24 – Waituna Creek Eastern Tributary –
Section Proposed to be Piped.**

Comments/Progress Record:



Prioritised Riparian Management Units (RMU) for 31201

Critical Source Area (CSA) - Biofilter



Description: Tile drain entry point into Waituna Creek. There are two large drains in this area that service two gullies and a number of paddocks. Possible location to install an underground nitrate filter. Further investigation required to ensure no impact on farm drainage and to assess peak flows.

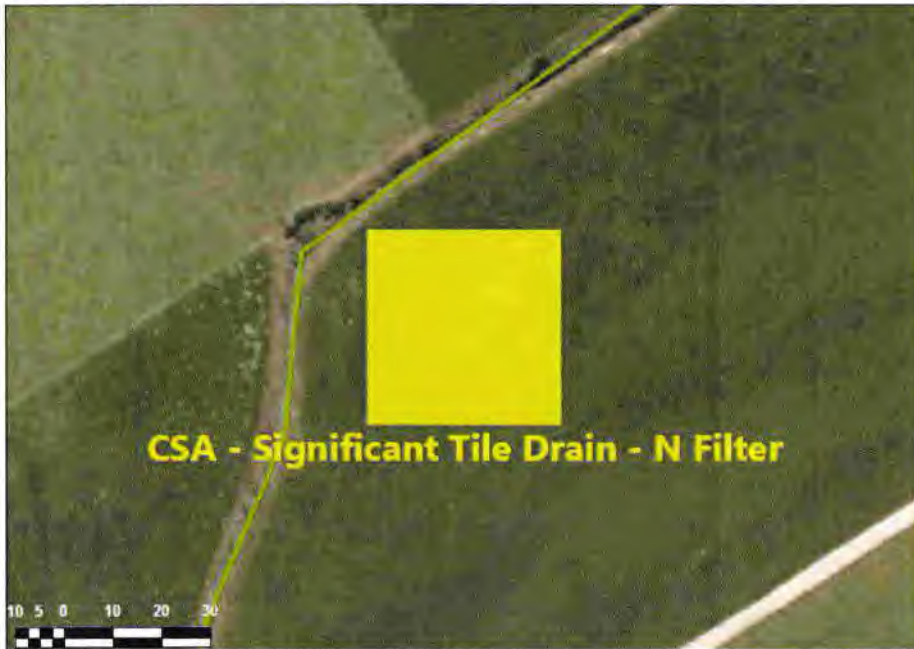
	<p>Photo 25 – Critical Source Area – Gully on eastern side of lane.</p>
	<p>Photo 26 – Critical Source Area – Entry to Waituna Creek</p>

Comments/Progress Record:



Prioritised Riparian Management Units (RMU) for 31201

CSA - Significant Tile Drain - N Filter



Description: Large tile drain enters Waituna Creek in this location. Possible location for a future nitrogen filter. Catchment is mostly in the neighbouring farm although a smaller section comes in from the western paddocks of OTO Trust.



Photo 27 – Critical Source Area – Significant Tile Drain.

Comments/Progress Record:



Prioritised Riparian Management Units (RMU) for 31201

CSA - Tile Drain Treatment



Description: It is proposed to pipe the small waterway from this location to the eastern boundary of the farm. When this is being undertaken (subject to consent being granted from Environment Southland) there is an opportunity to install a sediment retention pond in this location to treat tile drain water prior to it entering the open drain and Waituna Creek. This would treat water from a significant catchment including a large section of dairy farm 31203 (Phiskie's) and significantly reduce the amount of sediment and soil bound phosphorus entering Waituna Creek. Living Water funding would be available to assist with this.

Proposed completion dates:

- Construction of Retention Pond – February 2017.



Photo 28 – Small Tributary proposed to be piped.

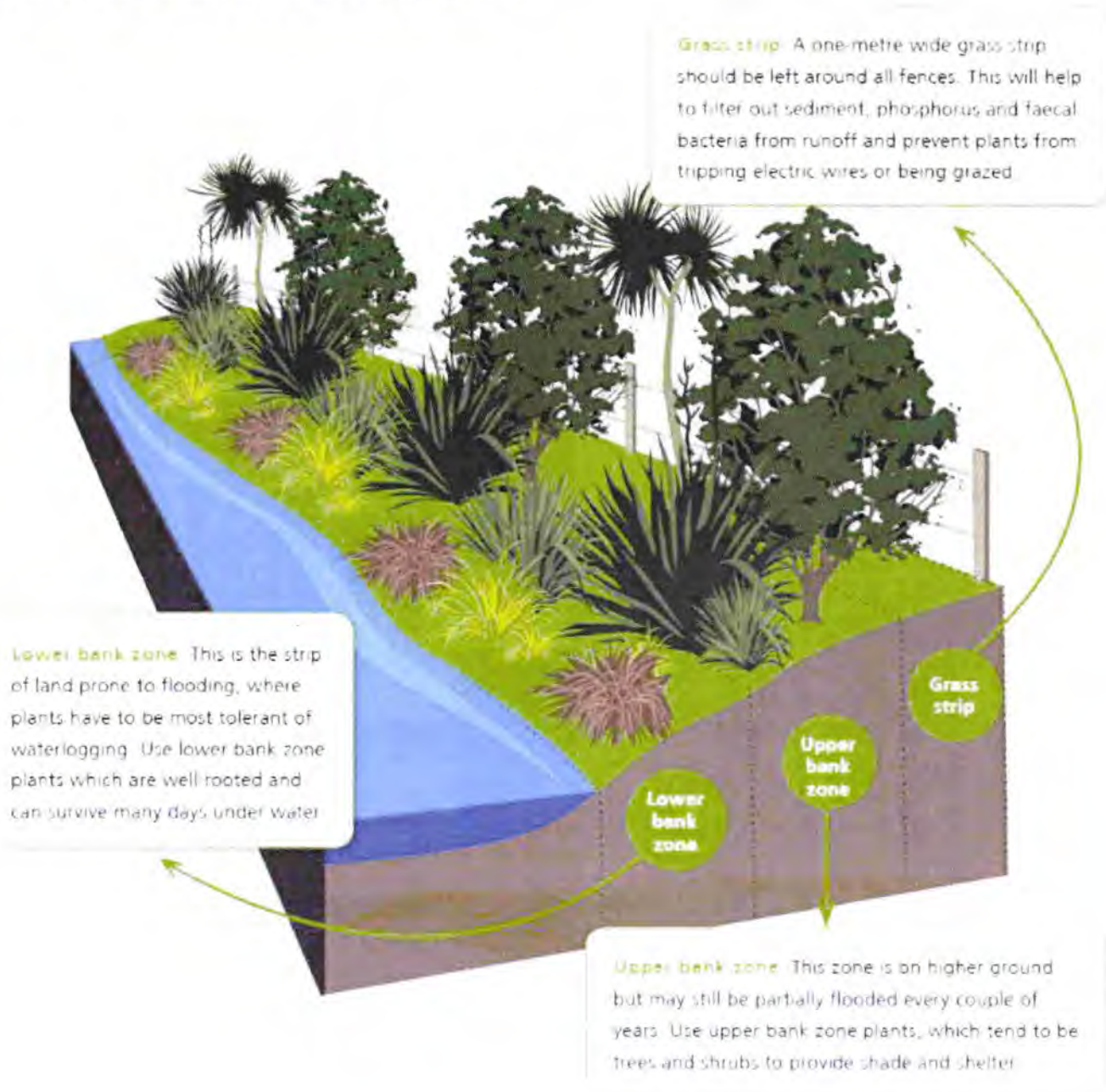


Photo 29 – Tile drain from Phiskie’s property entering small tributary

Comments/Progress Record:

Appendix 1:

Riparian Management Unit and planting “Zones”



Recommended plants Southland (Source: DairyNZ Riparian Management Plan (Southland))

FAST 5 PLANTS FOR SOUTHLAND



These 5 go-to plants are ideal to start your planting with – they are hardy, fast-growing, can be planted straight into pasture and don't require shelter. Ask your nursery for Eco-sourced plants that are hardiest.

Table of Riparian Plants

Tolerates key: ☀ Full sun 🌬 Wind 🌊 Salt wind ❄ Frost hardy 🌧 Poorly drained soil (boggy) ☀ Dry soil conditions

Benefits key: 🐦 Attracts birds 🐝 Attracts bees 🌱 Slope stabilisation 🌿 Filters runoff 🌳 Shade 🐟 Fish habitat

Plant name	Type	Tolerates	Benefits	Size (height x width)
Lower bank zone Space 1-1.5 m between plants				
Cabbage tree (tī kōkōka) <i>Cordyline australis</i>	Tree	☀ 🌬 🌊 ❄ 🌧 ☀	🐦 🐝 🌱 🌿 🌳	10 x 3 m
Pūrei <i>Carex secta</i>	Sedge	☀ 🌬 🌊 ❄ 🌧 ☀	🌱 🌿 🐟	0.75 x 1 m
Red tussock grass <i>Chionochloa rubra</i>	Grass	☀ 🌬 🌊 ❄ 🌧 ☀	🌱 🌿	1 x 1 m
Swamp sedge (pūrei) <i>Carex virgata</i>	Sedge	☀ 🌬 🌊 ❄ 🌧 ☀	🌱 🌿 🐟	0.75 x 1 m
Toetoe <i>Auzrodenia noltii</i>	Grass	☀ 🌬 🌊 ❄ 🌧 ☀	🌱 🌿	1.5 x 1.5 m
Upper bank zone Space 1.5-2 m between plants				
Mingimingi <i>Coprosma propinqua</i>	Shrub	☀ 🌬 🌊 ❄ 🌧 ☀	🐦 🌳	4 x 1.5 m
Swamp flax (harakeke) <i>Phormium tenax</i>	Other	☀ 🌬 🌊 ❄ 🌧 ☀	🐦 🐝 🌱 🌿 🌳	2 x 2 m
Black matipo (kōhūhū) <i>Pittosporum tenuifolium</i>	Small tree/tree	☀ 🌬 🌊 ❄ 🌧 ☀	🐦 🌱 🌳	8 x 3 m
Broadleaf (kapuka) <i>Gnaphalium tataricum</i>	Tree	☀ 🌬 🌊 ❄ 🌧 ☀	🐦 🌳	10 x 3 m
Kahikatea* <i>Caricarpus decaudensis</i>	Tree	☀ 🌬 🌊 ❄ 🌧 ☀	🐦 🌳	40-60 x 4 m
Karami <i>Coprosma robusta</i>	Shrub/small tree	☀ 🌬 🌊 ❄ 🌧 ☀	🐦 🌱 🌳	4 x 1.5 m
Kokomuka <i>Hebe elliptica</i>	Shrub	☀ 🌬 🌊 ❄ 🌧 ☀	🐦 🐝 🌳	1.8 x 1 m
Koromiko <i>Hebe salicifolia</i>	Shrub	☀ 🌬 🌊 ❄ 🌧 ☀	🐦 🐝 🌱 🌳	1.8 x 1 m
Kētukutuku* <i>Fuchsia excorticata</i>	Tree	☀	🐦 🌳	10 x 3 m
Lemonwood (tarata) <i>Pittosporum eugenioides</i>	Tree	☀ 🌬 🌊 ❄ 🌧 ☀	🐦 🌱 🌳	9 x 4 m
Lowland ribbonwood (mānātū) <i>Plagianthus regius</i>	Tree	☀ 🌬	🌱 🌳	10 x 3 m
Mānuka <i>Laportea scoparium</i>	Small tree	☀ 🌬 🌊 ❄ 🌧 ☀	🐦 🌱 🌳	4 x 1.5 m
Totara* <i>Podocarpus totara</i>	Tree	☀ 🌬 🌊 ❄ 🌧 ☀	🐦 🌱 🌳	20 x 4 m
Twiggy tree daisy <i>Olearia traversii</i>	Shrub	☀ 🌬 🌊 ❄ 🌧 ☀	🐦 🌳	4.5 x 4.5 m
Wineberry (mekomako)* <i>Aristotelia serrata</i>	Shrub/tree	☀	🐦 🐝 🌱 🌳	8 x 3 m

*Plant these species into existing vegetation or 2-3 years after initial plantings so they have shelter to grow.

For more information on plants to consider and managing a planting project please visit <http://www.dairynz.co.nz/media/660475/dairynz-riparian-management-southland.pdf>



THE PLANT STORE

ThePlantStore.co.nz

Henniew Amtink
Onr Drakes Hills Road
Seaward Downs,
Invercargill
amtink@xtra.co.nz
027 436 4607

27-04-17

Name of Plant	Grade	Quantity	Price	Total
Carex secta	Tinus Rootrainer	1840	\$3.30	\$6,072.00
Phormium Tenax	Tinus Rootrainer	450	\$3.30	\$1,485.00
Olearia Traversii	Tinus Rootrainer	45	\$3.30	\$148.50
Pittosporum tenuifolium	Tinus Rootrainer	225	\$3.30	\$742.50
Leptospermum scoparium	Tinus Rootrainer	150	\$3.30	\$495.00
Cordyline australis	Tinus Rootrainer	150	\$3.30	\$495.00
Cortaderia richardii	Tinus Rootrainer	300	\$3.30	\$990.00
Griselinia littoralis	Tinus Rootrainer	150	\$3.30	\$495.00
			Supply Total	\$10,923.00
Install				
Install consists of a pre spray, planting of plant, fertiliser supply and application along with a post planting watering.		3310	\$1.80	\$5,958.00
Plant protector - supply and install				
Plant protector consists of a KBC snap guard protector combo and install		3310	\$2.40	\$7,944.00
Maintenance 3 year				
Maintenance insures the plant is sprayed for weeds and fertilised over the course of 3 years post planting.		3310	\$2.70	\$8,937.00
			Job Total	\$33,762.00

All plants are southland eco sourced
90% survival rate of plants guaranteed at 3 year handover.

All the above prices **EXCLUDE GST**

If you have any queries, please don't hesitate in contacting me on 0277 369 464

Cheers,

Michael Tither



Key

Area to be planted

Notes:

2,200m of riparian planting

4.5m wide riparian planting area from stream to fence.

Two rows of planting on one side of stream.

Planting to be at least 1.5m away from fence.

Carex secta to be used on streamside row 1.2m apart.

Rest of the plants to be used as a random mix on fence side row 1.5m apart.



THE PLANT STORE
ThePlantStore.co.nz

Michael Tither 027 369 464
sales@theplantstore.co.nz

PLANTING PLAN

Drakes Hill Rd
Amtink Farms
SOUTHLAND
Email: amtinknz@xtra.co.nz

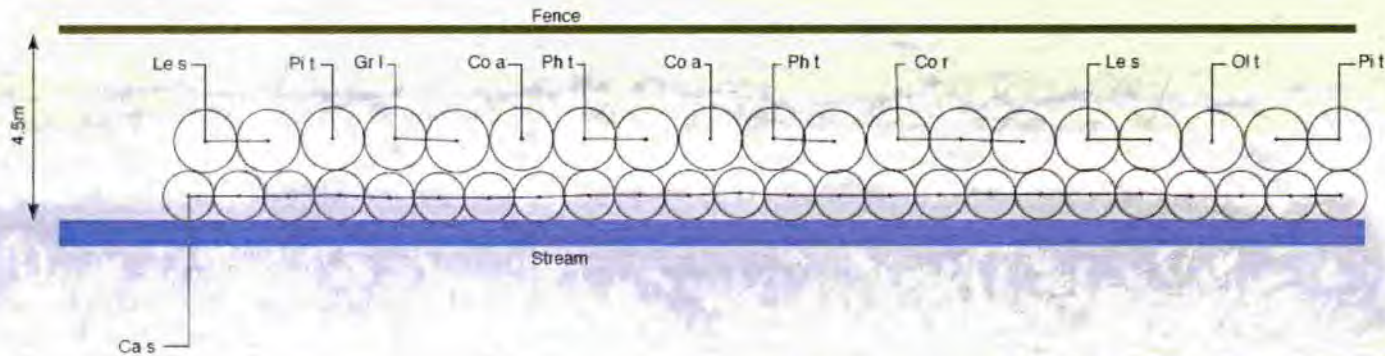
Scale

Date 10/04/2017

Drawn Ryan Hodgson

Drawing No. 1.0

Code	Botanical Name	Common Name	Grade	Spacing	Quantity
Ca s	<i>Carex secta</i>	Purei		1.2m	1840
Ph 1	<i>Phormium tenax</i>	Swamp Flax		1.5m	450
Cl 1	<i>Olearia traversii</i>	Chatham Is. Akeake		1.5m	45
Pi 1	<i>Pittosporum tenuifolium</i>	Black matipo		1.5m	225
Le s	<i>Leptospermum scoparium</i>	Manuka		1.5m	150
Co a	<i>Cordylne australis</i>	Cabbage tree		1.5m	150
Co f	<i>Cortaderia richardii</i>	Toetoe		1.5m	300
Gr l	<i>Grisebina littoralis</i>	Broadleaf		1.5m	150



Code	Botanical Name	Common Name	Grade	Spacing	Quantity
Ca s	<i>Carex secta</i>	Purei		1.2m	1840
Ph t	<i>Phormium tenax</i>	Swamp Flax		1.5m	450
OI t	<i>Olearia traversii</i>	Chatham is Akeake		1.5m	45
Pit	<i>Pittosporum tenuifolium</i>	Black matipo		1.5m	225
Le s	<i>Leptospermum scoparium</i>	Manuka		1.5m	150
Co a	<i>Cordyline australis</i>	Cabbage tree		1.5m	150
Co r	<i>Cortaderia richardii</i>	Toetoe		1.5m	300
Gr l	<i>Grisebina littoralis</i>	Broadleaf		1.5m	150

Notes:

2,200m of riparian planting

4.5m wide riparian planting area from stream to fence.

Two rows of planting on one side of stream.

Planting to be at least 1.5m away from fence.

Carex secta to be used on streamside row 1.2m apart.

Rest of the plants to be used as a random mix on fence side row 1.5m apart.



Michael Tither 027 369 464
sales@theplantstore.co.nz

EXAMPLE PLAN
Drakes Hill Rd
Amtink Farms
SOUTHLAND
Email: amtinknz@xtra.co.nz

Scale 1:100

Date 10/04/2017

Drawn Ryan Hodgson

Drawing No. 2.0